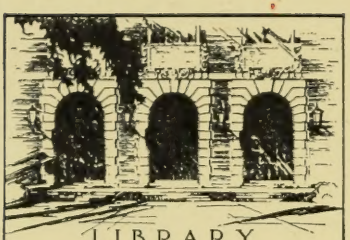

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# UNDERGRADUATE STUDY

1951-1952

UNIVERSITY OF ILLINOIS BULLETIN

**UNIVERSITY OF ILLINOIS BULLETIN**

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UNIVERSITY OF ILLINOIS

# UNDERGRADUATE STUDY

## 1951-1952

PUBLISHED BY THE UNIVERSITY
*Urbana* 1951

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# UNIVERSITY CALENDAR

## DEPARTMENTS AT URBANA

### 1951—First Semester

| | |
|---|---|
| Entrance examinations | Sept. 4, Tues.—Sept. 7, Fri. |
| Freshman week | Sept. 10, Mon.—Sept. 15, Sat. |
| Registration of graduates and undergraduates | Sept. 12, Wed.—Sept. 15, Sat. |
| Instruction begins | Sept. 17, Mon. |
| Thanksgiving vacation begins | Nov. 21, Wed., 1 P.M. |
| Thanksgiving vacation ends | Nov. 26, Mon., 1 P.M. |
| Illinois Day (State admitted to the Union, 1818) | Dec. 3, Mon. |
| Christmas vacation begins | Dec. 20, Thurs., 1 P.M. |
| Christmas vacation ends | Jan. 3, Thurs., 1 P.M. |
| Semester examinations | Jan. 18, Fri.—Jan. 26, Sat. |
| Commencement Exercises | Feb. 10, Sun. |

### 1952—Second Semester

| | |
|---|---|
| Entrance examinations | Jan. 22, Tues.—Jan. 28, Fri. |
| Registration of graduates and undergraduates | Jan. 31, Thurs.—Feb. 2, Sat. |
| Instruction begins | Feb. 4, Mon. |
| University Day (University opened, 1868) | Mar. 2, Sun. |
| Easter vacation begins | April 10, Thurs., 1 P.M. |
| Easter vacation ends | April 16, Wed., 1 P.M. |
| Honors Day | May 2, Fri. |
| Memorial Day (holiday) | May 30, Fri. |
| Semester examinations | May 24, Sat.—June 3, Tues. |
| Commencement Exercises | June 15, Sun. |

### 1952—Summer Session

| | |
|---|---|
| Entrance examinations | June 3, Tues.—June 6, Fri. |
| Registration of graduates and undergraduates | June 13, Fri.—June 14, Sat. |
| Instruction begins | June 16, Mon. |
| Independence Day (holiday) | July 4, Fri. |
| Summer session examinations | Aug. 8, Fri.—Aug. 9, Sat. |

## UNDERGRADUATE DIVISION AT CHICAGO

### 1951—First Semester

| | |
|---|---|
| Orientation period | Sept. 5, Wed.—Sept. 12, Wed. |
| Registration | Sept. 13, Thurs.—Sept. 15, Sat. |
| Instruction begins | Sept. 17, Mon. |
| Thanksgiving vacation begins | Nov. 20, Tues., 6 P.M. |
| Thanksgiving vacation ends | Nov. 26, Mon., 8 A.M. |
| Illinois Day (State admitted to the Union, 1818) | Dec. 3, Mon. |
| Christmas vacation begins | Dec. 21, Fri., 6 P.M. |
| Christmas vacation ends | Jan. 3, Thurs., 8 A.M. |
| Semester examinations | Jan. 16, Wed.—Jan. 24, Thurs. |

### 1952—Second Semester

| | |
|---|---|
| Orientation period | Jan. 22, Tues.—Jan. 30, Wed. |
| Registration | Jan. 31, Thurs.—Feb. 2, Sat. |
| Instruction begins | Feb. 4, Mon. |
| University Day (University opened, 1868) | Mar. 2, Sun. |
| Easter vacation begins | April 10, Thurs., 6 P.M. |
| Easter vacation ends | April 17, Thurs., 8 A.M. |
| Honors Day | May 9, Fri. |
| Memorial Day (holiday) | May 30, Fri. |
| Semester examinations | May 24, Sat.—June 3, Tues. |

### 1952—Summer Session

| | |
|---|---|
| Registration | June 13, Fri.—June 14, Sat. |
| Instruction begins | June 16, Mon. |
| Independence Day (holiday) | July 4, Fri. |
| Summer session examinations | Aug. 8, Fri.—Aug. 9, Sat. |

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V Lewis Bassie, Director of the Bureau of Economic and Business Research
205 David Kinley Hall
Earl P. Strong, Director of Business Management Service
408 David Kinley Hall

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222 Library

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207 Administration Building (E)

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# GENERAL INFORMATION

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General Requirements for Graduation

Honors

Libraries

Counseling Services

Employment

Scholarships

Loan Funds

Prizes and Awards

Illini Union

The Broadwall

# UNDERGRADUATE STUDY

Undergraduate instruction is offered by the University of Illinois in the colleges, schools, and divisions described in this catalog. The curricula and major programs listed under each college are designed to prepare the student for a specific career in his chosen field. On completion of any one of these curricula a bachelor's degree is conferred. The Undergraduate Division at Chicago offers curricula and courses identical with those offered on the main campus at Urbana.

Graduate instruction is offered on the Urbana campus of the University of Illinois in the fields of learning described in the Graduate College catalog. Professional and graduate courses in medicine, dentistry, and pharmacy are offered on the Chicago campus of the University and are described in separate catalogs issued by the Chicago Professional Colleges.

## ADMISSION

For admission to the colleges and schools at Urbana and to the Undergraduate Division at Chicago, each student must file an application blank with the officers listed below. Official credentials should be sent directly from each institution previously attended.

For admission at Urbana, to the Director of Admissions and Records, University of Illinois, Urbana.

For admission to the Undergraduate Division in Chicago, to the Examiner and Recorder, University of Illinois, Navy Pier, Chicago 11.

A permit to enter is issued only on the basis of official detailed credentials, filed in advance, which meet the requirements for admission. Credentials accepted for admission become the property of the University and are kept permanently in the files. If an applicant's credentials are not received until the week before the date for registration, it may not be possible to notify the applicant of his status prior to his arrival on the campus.

Applicants for admission who come from foreign countries must make all arrangements in advance. They must furnish complete official credentials and evidence that they are able to meet in full the cost of attending the University. Certificates in a foreign language must be accompanied by certified translations.

Qualified applicants are admitted at the beginning of any term. Applicants for admission to the College of Engineering, the College of Law, and the School of Journalism and Communications will find it to their advantage to enter the first semester rather than the second.

All new students, on entering the University, are required to take a

physical examination. Before registration, a new student must secure an appointment with the University Health Service for his physical examination. The examination is given by the University at the time of appointment without cost to the student. If the student fails to take the examination at the appointed time and does not present an excuse from the Director of Admissions and Records, a fee of $5 is charged to provide for a special examination, or the student will be required to be examined at his own expense outside the University in a manner meeting the requirements of the Health Service.

Candidates for admission to the School of Physical Education must pass special physical and medical examinations. Those entering occupational therapy must pass a special health examination.

## REQUIREMENTS FOR ADMISSION

### Age

An applicant must be at least sixteen years of age. The dean of the college concerned, however, may admit on petition a student fifteen years of age who meets all other requirements for admission and who is to reside, while attending the University, with his parents or guardian, or with someone selected by them.

### High School Graduation

To be admitted by certificate, an applicant must be a graduate of an accredited secondary school. If the school is in Illinois, it must be fully recognized by the Superintendent of Public Instruction; if located elsewhere, its rating must be equivalent to full recognition. (For a list of sources from which credits are accepted on certification, see page 16; and for a statement of the conditions on which nongraduates may be admitted, see page 16.

**High School Graduates Who Rank in the Upper Half of Their Class.** The Director of Admissions is authorized to admit, without adhering to the usual requirements as they pertain to majors and minors, an applicant whose rank in scholarship is in the upper 50 per cent of his graduating class. Such a student, however, must present those specific high school courses that are prerequisite to courses in the curriculum which he desires to follow in the University.

**High School Graduates Who Rank in the Lowest Quarter of Their Class.** A graduate of an accredited high school who is a resident of Illinois, whose rank in scholarship is in the lowest quarter of his graduating class, and who meets the requirements as stated below, is admitted by certificate to probationary status and, in connection with his first registration in the University, is required to take such tests as may be prescribed by the Student Counseling Bureau. Such a student, immediately upon registration, is placed under the special supervision of the dean of the college or the director of the school in which he is enrolled. He may be required to carry a reduced program of work or a program especially arranged to meet his needs.

The student's rank is to be based on work completed in grades nine, ten, eleven, and twelve in the case of four-year high schools, and on work completed in grades ten, eleven, and twelve in the case of three-year senior high schools.

**Nonresidents of Illinois.** A nonresident of Illinois seeking admission as a freshman must rank in the upper half of his high school graduating class.

### Applications of High School Seniors

The Director of Admissions is authorized to consider for admission high school seniors who have not yet graduated, on the basis of the following official documents from the high school principal:

1. Residents of Illinois who rank in the upper half of their class and nonresidents who

rank in the upper third: a statement of seven semesters of completed high school work, a statement of courses to be taken in the final semester, the date of probable graduation, and an estimate of the applicant's rank in his class.

2. Residents of Illinois regardless of rank in class and nonresidents who rank in the upper half: a statement of seven semesters of completed high school work and grades in each subject at the middle of the final semester, the date of probable graduation, and the applicant's rank in his class.

## Fifteen Units Required

Fifteen units of acceptable secondary school work are required, including the following:

I. Two majors and one minor, selected from Groups 1-5 below. One of the majors must be English. (For definitions of *Unit*, *Major*, and *Minor*, see below.)

II. A total of at least nine units from the fields of English, foreign language, mathematics, science, and social studies, including preparation amounting to a major or minor sequence in at least three different fields. (See Groups 1-5 below.)

III. All subjects prescribed for the curriculum which the applicant desires to enter, as stated in the table on pages 14 and 15.

IV. The six remaining units necessary for admission may be selected from any of the high school subjects which are accepted by an accredited school toward its diploma and which meet the standards for accrediting. Fractional credits of the value of less than one-half unit will not be accepted. Not less than one unit of work will be accepted in a foreign language, elementary algebra, plane geometry, physics, chemistry, or biology.

The University realizes the obligation of the high school to meet fully the needs and interests of all pupils. It, therefore, believes that high schools should offer courses in such fields as agriculture, art, commerce, home economics, industrial arts, and music; and it accepts them as electives for admission.

## Definitions

**Unit.** A unit course of study in the secondary school is a course covering an academic year and including not less than the equivalent of 120 sixty-minute hours of classroom work. Two hours of work requiring little or no preparation outside the class are considered as equivalent to one hour of prepared classroom work.

**Major.** A major consists of three unit courses in one field. (See special requirements for a major in each of the various fields as stated below.

**Minor.** A minor consists of two unit courses in one field. (See special requirements for a minor in each of the various fields as stated below.

## Majors and Minors

The required majors and minors defined above may be selected from the following five groups:

**1. English.** (In all cases one major must be in English.) Only courses in history and appreciation of literature, composition (including oral composition when given as a part of a basic English course), and grammar will count toward a major.

**2. Foreign Language.** Three units in one language constitute a major. Two units in one language constitute a minor.

**3. Mathematics.** Only courses in algebra, plane geometry, solid and spherical geometry, and trigonometry will be accepted toward a major or minor in this subject. For students entering in September, 1953, and thereafter, the College of Engineering will require four units of mathematics for admission to full freshman status (see page 19). (General mathematics may be accepted in lieu of algebra and geometry in cases where the content of the course is essentially the same as that ordinarily included in algebra and geometry.)

**4. Science.** (Including physics; chemistry; biology, or botany and zoology; general science, or physiology and physiography; astronomy; and geology.) The three units required for a major must include at least a total of two units chosen from one or more of the following subjects: physics, chemistry, botany, and zoology. Biology may be offered in place of botany and zoology. The two units required for a minor must include at least one unit from the above subjects.

**5. Social Studies.** (Including history, civics, economics, commercial or economic geography, and sociology.) The three units required for a major must include at least two units in history. The two units required for a minor must include at least one unit in history.

# REQUIRED AND RECOMMENDED SUBJECTS FOR ADMISSION TO THE VARIOUS UNDERGRADUATE CURRICULA

(See also descriptive material about majors and minors on page 13)

| Colleges and Schools | Subjects Required for Admission | Subjects Recommended for Admission |
|---|---|---|
| **COLLEGE OF LIBERAL ARTS AND SCIENCES** | | |
| General Curriculum with majors in Bacteriology, Botany, Classics (Latin or Greek), Economics, English, Entomology, French, Geography, Geology, German, History, History of Art, Italian, Latin American Studies, Medieval Civilization, Philosophy, Political Science, Psychology, Rhetoric and Composition, Social Sciences, Sociology, Spanish, Speech, Zoology<br>General Curriculum preparatory to Education, Journalism, Law<br>Division of General Studies<br>Occupational Therapy (See statement of special requirements on page 20)<br>Teacher-training Curricula | English, 3 units[1]<br>Language, 2 units[2] | Language, 3 units in one language, instead of the required 2 units<br>Science, 2 units (including biology)<br>Social studies, 2 units |
| General Curriculum with majors in Chemistry, Home Economics, Physics, Mathematics, Physiology<br>Special Curricula preparatory to Dentistry,[3] Medicine,[3] Nursing, Veterinary Medicine[3]<br>Teacher-training Curricula | English, 3 units[1]<br>Language, 2 units[2]<br>Algebra, 1 unit<br>Geometry, 1 unit | Mathematics, 3 units, instead of the required 2 units<br>Science, 2 units (including physics or chemistry or both)<br>Social studies, 2 units |
| Special Curricula in Chemistry and Chemical Engineering | English, 3 units[1]<br>Language, 2 units[2]<br>Algebra, 1½ units<br>Geometry, 1 unit | Language, 4 units (including 2 units in French and 2 units in German)<br>Mathematics, 3 units, instead of the required 2½ units<br>Science, 2 units (including physics or chemistry or both)<br>Social studies, 2 units |
| **COLLEGE OF AGRICULTURE** | | |
| Curricula in Agricultural Science, Agriculture, Dairy Technology, Floriculture, Food Technology, Home Economics, Pre-Forestry, and Restaurant Management<br>Teacher-training Curricula | English, 3 units[1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Mathematics, 3 units, instead of the required 2 units<br>Science, 2 units (including physics)<br>Social studies, 2 units |
| **COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION** | | |
| All Fields (Accountancy, Banking and Finance, Commerce and Law, Commercial Teaching, Economics, Industrial Administration, Management, Marketing, Personnel Management, Public Affairs, Secretarial Training) | English, 3 units[1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Advanced algebra, ½ unit<br>Science, 2 units (including 1 unit with laboratory) |
| **COLLEGE OF EDUCATION** | | |
| Curricula in Industrial Education, for Teachers of the Deaf, and Teachers of the Mentally Handicapped[4] (other curricula require junior standing in the University) | English, 3 units[1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Industrial arts, 2 units (for industrial education only)<br>Science, 2 units (including physics or chemistry or both)<br>Social studies, 2 units |
| Curriculum for Elementary Teachers | English, 3 units[1] | Language, 2 units (for curricula for teachers of the deaf and mentally handicapped) |
| **COLLEGE OF ENGINEERING** | | |
| All Curricula (Aeronautical, Agricultural, Ceramic, Civil, Electrical, General, Mechanical, Metallurgical, Mining, Public Health, Sanitary Engineering, Engineering Physics)<br>See also page 19. | English, 3 units[1]<br>Algebra, 1½ units[5]<br>Plane geometry, 1 unit<br>Solid geometry, ½ unit[5] | Language, 2 units<br>Science, 2 units (including physics or chemistry or both)<br>Social studies, 2 units<br>Industrial arts, 2 units |
| **COLLEGE OF FINE AND APPLIED ARTS** | | |
| Curriculum in Architecture (with general and engineering options) | English, 3 units[1]<br>Algebra, 1½ units[5]<br>Geometry, 1 unit | Freehand drawing, 1 unit<br>Science, 2 units (including physics and chemistry)<br>Social studies, 2 units (including economics and history) |

## REQUIRED AND RECOMMENDED SUBJECTS (CONCLUDED)

| Colleges and Schools | Subjects Required for Admission | Subjects Recommended for Admission |
|---|---|---|
| Curricula in Art (Advertising Design, Art Education, History of Art, and Painting) | English, 3 units[1]<br>Language, 2 units[2] | Freehand drawing, 1 unit<br>Language, 3 units in one language instead of the required 2 units<br>Social studies, 2 units |
| Curriculum in Art (Industrial Design) | English, 3 units[1]<br>Algebra, 1½ units[5]<br>Geometry, 1 unit<br>Language, 2 units[2] | Freehand drawing, 1 unit<br>Language, 3 units in one language instead of the required 2 units<br>Social studies, 2 units |
| Curricula in Landscape Architecture and Landscape Operation | English, 3 units[1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Botany, 1 unit<br>Freehand drawing, 1 unit<br>Mathematics, 3 units instead of the required 2 units<br>Social studies, 2 units (including civics and economics) |
| **SCHOOL OF MUSIC** | | |
| All Curricula (Instrumental, Voice, and Theory Majors, and Music Education) | English, 3 units[1]<br>Language, 2 units[2]<br>Music (individual examination required)[6] | Music, 1 unit, and additional private study for two years<br>Science, 1 unit (with laboratory)<br>Social studies, 2 units |
| **SCHOOL OF PHYSICAL EDUCATION** | | |
| Curricula in Dance (for Women), Health Education, Physical Education for Men and for Women, and Recreation | English, 3 units[1] | Science, 3 units (including biology<br>Social studies, 2 units<br>Health and safety education and participation in school programs of physical education and athletics |
| **INSTITUTE OF AVIATION** | | |
| Curriculum in Aircraft Maintenance | English, 3 units[1]<br>Algebra, 1 unit<br>Geometry, 1 unit | This is a two-year terminal curriculum |

### NOTES

[1] English. Only courses in the history and appreciation of literature, and in composition (including oral composition when given as a part of a basic English course) and grammar, will count toward the three units in English required as a major for admission to all curricula. Four units in English, while not required for any curriculum, are recommended by all the colleges and schools.

[2] Language. The foreign language requirement for admission to any curriculum is fulfilled by two units in any one of the following: German, French, Spanish, Italian, Latin, Greek. For some curricula three units in one language are recommended, and for some it is advantageous to have four units in one language or a combination of languages. Less than one unit in a language is not acceptable for admission.

[3] Predental, Premedical, and Preveterinary Requirement. A student entering the predental curriculum, the premedical curriculum, or the preveterinary curriculum as a freshman must have a scholarship rank in the upper half of his high school graduating class. A student transferring to one of these curricula from another college or university must have a scholastic average in his collegiate work not less than 3.5 in terms of the grading system of the University of Illinois. A scholastic average of 3.75 is required of transfers to the premedical curriculum who have completed three or more semesters of work elsewhere.

[4] For admission to the curricula for teachers of the deaf and the mentally handicapped the applicant must rank in the upper 25 per cent of his high school graduating class, or, if he is a transfer student, must have a scholastic average of at least 3.5 (half way between "B" and "C").

[5] Mathematics. In Engineering and Fine and Applied Arts where advanced algebra or solid geometry, or both, are required, students who have only one unit in algebra and one unit in geometry, and who meet all other entrance requirements, may be admitted on condition that the deficiency be removed during their first year of residence. Where one unit in algebra and one unit in geometry are required for admission, general mathematics will be accepted if the content of the course is essentially the same as that ordinarily included in algebra and plane geometry. For all curricula involving chemistry (to which one unit in physics or chemistry or two and one-half units in mathematics are prerequisite), students without credit in physics or chemistry who have only two units in mathematics will be required to take college algebra.

[6] Music Examination. Each applicant for admission to the School of Music is required to take an individual examination in his major field for the purpose of demonstrating that he is qualified and has sufficient knowledge of music to enter courses in applied music. The examination is given four times during the year. No entrance credit is allowed. For further information, write to the School of Music, Urbana.

## Required and Recommended Subjects

The second column of the table on pages 14 and 15 shows the special subjects prescribed for admission to the various undergraduate curricula. These are the subjects which are considered essential preparation and without which the student may not be admitted. The requirements are stated in units of credit and not in terms of majors and minors. These prescribed subjects may be counted toward fulfilling the major and minor requirements. In planning his high school work the prospective student should be guided also by the recommended subjects shown in the third column. It will be noted that these recommendations indicate the desirability of presenting more than the minimum requirement of nine units from the fields of English, foreign language, social studies, and science. Students who take a greater amount of work in these areas are apt to have a more satisfactory educational experience in the University.

## Graduates of Unaccredited Secondary Schools

Graduates of unaccredited secondary schools which offer four years of instruction are admitted by examination. The Director of Admissions and Records, however, is authorized to admit a student who is a graduate of such an unaccredited secondary school and whose general scholarship rank is in the upper 25 per cent of his graduating class, subject to his passing at the University in advance of admission: (1) a test in English composition and rhetoric; and (2) such other examinations and tests in high school subjects as may be necessary to complete the University entrance requirements and the special requirements of the chosen curriculum.

## Students from Accredited Secondary Schools Who Are Not Graduates

An applicant who has attended, but who has not been graduated from, an accredited school, must pass entrance examinations in English composition and four units in additional subjects to be designated by the University authorities. The remaining units required for admission may also be made in entrance examinations or may be offered by certificate from an accredited school.

## Graduates of Three-Year Senior High Schools

In the case of graduates of a school organized as a three-year senior high school, including grades ten, eleven, and twelve, at least twelve units must have been taken in the senior high school. Two majors and one minor, or four minors, must be from the fields of English, foreign language, mathematics, science, and social studies. (See Groups 1-5, page 13.) Either a major or a minor must be from the field of English. One unit of a foreign language and one unit of mathematics may be accepted from work completed in the ninth grade as a part of the majors and minors, provided at least seven units of senior high school work have been completed in subjects included in the above-enumerated fields. The remaining five units may be selected from any of the senior high school subjects which are accepted by an accredited high school toward its diploma and which meet the standards of accrediting as defined by the University.

The transcript of credits certified by the senior high school must show any credit in mathematics or foreign language accepted from the ninth grade if these subjects have been continued in the senior high school. Fractional credits of the value of less than one-half unit will not be accepted. Not less than one unit of work will be accepted in a foreign language, elementary algebra, plane geometry, physics, chemistry, and biology.

## Sources of Acceptable Credits

The credits required for admission to the undergraduate departments, as detailed above, may be secured in three ways: (1) by *certificate* from an accredited high school or other secondary school; (2) by *examination;* and (3) by *transfer* from another university or college of recognized standing.

## Admission by Certificate

A student presenting a certificate from any fully recognized high school or preparatory school in Illinois is given entrance credit for all the subjects named therein for which the school is specifically accredited.

Entrance credits are also accepted on certificate from the following sources:

1. Schools accredited by the North Central Association of Colleges and Secondary Schools.
2. Schools accredited by the Southern Association of Colleges and Secondary Schools.
3. Schools approved by the New England College Entrance Certificate Board.
4. High schools and academies registered by the Regents of the University of the State of New York.
5. Schools accredited to the state universities which are included in the membership of the North Central Association and the Southern Association of Colleges and Secondary Schools, provided the certificate shows that the Illinois standard time requirements have been met.
6. Schools approved by state universities in states not included in the territories of the above-mentioned accrediting agencies.
7. The state teachers colleges of Illinois and other state teachers colleges having equal requirements for graduation.

## Admission by Examination

Entrance examinations are given by the University several times each year as shown in the calendar on page 4. They are given in Chicago four times each year, in March, June, August, and December. These examinations cover substantially all the subjects required or accepted for admission. For brief outlines of the requirements in the various subjects, textbooks suggested for study, and examination programs, address the Director of Admissions and Records.

Credit for admission will be accepted from examinations conducted by the College Entrance Examination Board and by the New York Regents, if passed with a grade of 60 per cent or higher, subject to the requirements of majors, minors, and special subjects as listed on preceding pages.

## Admission by Transfer

A person who has attended another college or university of recognized standing will be considered for admission to the University of Illinois on presenting (1) a transcript of his college record, (2) a certificate of honorable dismissal from the institution from which he comes, and (3) an official statement of his preparatory school work. A nonresident of Illinois seeking transfer to any undergraduate curriculum must present a scholarship average of at least 3.5 (half way between "B" and "C") in terms of the grading system of the University of Illinois.

A person whose record at some other institution comes within either of the following classifications may enter the University only on approval of the dean of the college concerned and under conditions imposed by him: (1) A person on probation at, or dropped from another institution for poor scholarship or for disciplinary reasons. (In the latter case he must also obtain approval of the University Senate Committee on Discipline.) (2) A resident of Illinois whose scholastic average is less than "C" (3.0) in terms of the grading system of the University of Illinois.

An Illinois resident with a scholarship average of at least 3.3, or a nonresident with an average of at least 3.75 whose credentials otherwise are satisfactory, may be granted *provisional* admission at any time after he has begun his final semester or quarter at the institution he is currently attending. (Under the grading system at the University 3.0 is "C" and 4.0 is "B".)

No substitutes will be accepted for the high school subjects *prescribed* by the University or for the requirement of high school graduation, except that: (1) A student who comes from an institution rated in Class A by the University with a record of at least thirty semester hours without failures, and with an average grade ten points above the passing grade of the college, may be matriculated in a similar curriculum in the University, irrespective of deficiencies in prescribed subjects (except when necessary as prerequisites for advanced work to be taken here), whether or not he is a high school

graduate. (2) The Director of Admissions is authorized to waive the high school graduation requirement, but not the subject requirements, in the case of a transfer student who has completed a year of satisfactory work in a college, normal school, or junior college rated in Class A or Class B by the University.

Credits may be accepted for advanced standing from another university or a college, or a junior college of recognized standing, or from a state teachers college. A student who has passed a course at the University of Illinois may not be given credit for the same course taken elsewhere. In general it is unwise for a student to enter a specialized curriculum at the University as late as the beginning of the senior year. Students intending to transfer to the University should send their credentials to the Director of Admissions as early as possible.

If transferring to the predental curriculum, the premedical curriculum, the preveterinary curriculum, the curriculum preparatory to teaching in the elementary school, or the curricula for teachers of the deaf and mentally handicapped, the student must have a scholastic average in his college work of at least 3.5 in terms of the grading system of the University of Illinois. If transferring to the premedical curriculum with three or more semesters completed elsewhere, he must have a scholastic average of not less than 3.75. If transferring to the curriculum in engineering physics, he must have a scholastic average of at least 3.5 in all subjects, exclusive of the basic courses in military training and physical education, and a combined grade average of at least 3.5 in all subjects in mathematics and physics.

The registration of students in chemistry courses, other than those ordinarily open to freshmen and sophomores, is limited with few exceptions, to those having a 3.5 general average, exclusive of the basic courses in military training and the required work in physical education and hygiene, or an average of at least 3.5 in chemistry courses. Those who desire to register in the curriculum of chemistry or chemical engineering must fulfill the former requirements. Transfer students to be admitted must have a corresponding record in the institution (or institutions) from which they transfer and must maintain a similar average at the University of Illinois.

Students in large numbers enter the University after completing one, two, or even three years at the other universities and colleges in Illinois. In recognition of this situation the University is cooperating with the higher institutions in the state in their endeavor to coordinate their work with that of the University. In order that information may be had in advance in regard to the credit to be allowed from a specific institution, the University has adopted certain standards for accrediting and has classified the higher institutions within the state in accordance with the manner in which they are able to meet these standards. Students from the colleges which have met these standards in full, on entering the University, receive hour-for-hour credit; but in applying for a degree they are expected to conform to all the requirements of their chosen curricula. The Director of Admissions, on application, will furnish full information in regard to the transfer of credit.

## Advanced Standing by Examination

Advanced standing in the undergraduate colleges is granted only by examination unless the applicant is from an approved school.

## Undergraduate Credit for Service and for Education in the Armed Forces

The University, under general provisions administered by the Committee on Admissions from Higher Institutions, will recognize for college credit certain training and experience in the Armed Forces. Credit in military training and required physical education and hygiene will be approved when a person, honorably discharged, presents evidence that he has completed the basic training program in the Air Force, Army, Navy, Marine Corps, or Coast Guard. The Committee will recognize for credit correspondence courses of college grade, the general educational development examinations and the examinations in special fields prepared by the United States Armed Forces Institute. The College Training Programs of the Army, Navy, and Marine Corps which functioned during World War II will be accepted as credit when transferred from the institution where they were taken. The Committee will consider for credit work done in Air Force, Army, Navy,

Marine Corps, and Coast Guard Specialized and Technical Schools where its equivalence in terms of college courses is established by proficiency examinations, or where such courses have been recommended for college credit in the Guide to the Evaluation of Educational Experience in the Armed Services published by the American Council on Education.

## Unclassified Students

Persons over twenty-one years of age may be admitted as unclassified students (not candidates for a degree) in the undergraduate colleges, provided they secure the recommendation of the instructor whose work they wish to take and the approval of the dean of the college concerned. They must give evidence that they possess the requisite information and ability to pursue profitably, as unclassified students, their chosen subjects, and they must meet the special requirements for the particular college in which they wish to enroll, as stated below.

No one may enroll as an unclassified student in any school or college of the University *for more than two years,* except by special permission, application for which must be made through the dean of the college.

A person registered as an unclassified student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

For certain of its colleges the University has adopted special requirements for the admission of unclassified students. These are as follows:

**College of Agriculture.** In the case of men, two years of experience in practical agriculture are required. Any applicant accepted who is unable to satisfy the regular entrance requirements in English must study English in the University until the deficiency is removed.

**College of Commerce and Business Administration.** A written application must be presented, accompanied by official certificates showing the character and extent of preparatory work accomplished and honorable dismissal from the school last attended. Statements from employers or official superiors may also be presented as collateral evidence of the candidate's qualifications.

**College of Engineering.** The applicant must satisfy the regular entrance requirements in mathematics (algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit) and English (English composition and literature, 3 units).

**College of Law.** No credit earned by an unclassified student in the College of Law may be counted toward a degree in law.

**College of Liberal Arts and Sciences.** A written application must be presented, accompanied by official certificates indicating the applicant's preparatory work and showing honorable dismissal from the school last attended.

## Admission to Correspondence Courses

Correspondence courses are open to any applicants who can meet the University entrance requirements and also to persons eighteen or more years of age whose applications are approved by the Dean of University Extension. For further information address the Dean, 118 Illini Hall, Champaign, Illinois.

## Admission to the College of Engineering Beginning September, 1953

For students entering the College of Engineering in September, 1953, and thereafter, the mathematics requirement for admission to full freshman standing will be as follows: algebra, 2 units; plane geometry, 1 unit; solid geometry, ½ unit; trigonometry, ½ unit.

Students who present only one unit in algebra and one unit in geometry, and who meet all other requirements, may be admitted on the condition that the deficiencies be removed during their first year of residence, and with the understanding they can not complete the requirements for a degree in eight semesters.

Students who do not present the four units in mathematics as specified may be admitted to full standing by passing a proficiency examination at the University which will indicate their preparation is adequate for entrance into analytical geometry.

### Admission to the Occupational Therapy Curriculum

The curriculum in occupational therapy, leading to the degree of Bachelor of Scier in Occupational Therapy from the College of Medicine, is offered to men and women w are able to meet the requirements listed below.

At present the program consists of a minimum of five semesters in the College Liberal Arts and Sciences at Urbana, and five terms in the College of Medicine in Chicag The work on the Urbana campus is divided into two levels. The first two semesters co stitute the pre-professional curriculum, while the third, fourth, and fifth semesters co stitute the professional phase of the work at Urbana.

**Pre-Professional Curriculum.** An applicant for admission to this curriculum mu meet the following requirements:

1. He must be a graduate of an accredited high school and meet the general requir ments for admission to the College of Liberal Arts and Sciences;
2. He must rank in the upper 50 per cent of his high school graduating class, satisfactorily pass examinations given by the Student Counseling Bureau;
3. He must be under thirty years of age;
4. A health examination given by the University Health Officer must be passe satisfactorily;
5. An interview is required with either the Associate Dean of the College of Liber Arts and Sciences or the Head of the Department of Occupational Therapy.

All of the above requirements must be certified to the Director of Admissions befo a permit to enter is issued. The applicant should arrange for the examinations and i terview well in advance of the beginning date of the semester in which he plans to ente

**Professional Curriculum.** The number of students admitted to the professional cu riculum is limited by facilities in the College of Medicine. Selections for admission to th curriculum are made by the Committee on Admissions. Candidates are selected on th basis of scholastic record and such examinations and other evidence as the Committee ma require, and are notified of their acceptance or rejection prior to the beginning of the third semester of registration at Urbana.

Permission to pursue that portion of the work which is given at the College of Med cine is dependent on the achievement in previous university work. A university scholarshi average of 3.5 is a minimum requirement. Eligibility is determined by the Admissions Con mittee of the Curriculum in Occupational Therapy after a careful study is made of a pertinent evidence. Other factors being equal, preference will be given to candidates wh are residents of Illinois.

**Transfer Students.** Transfer students must complete an interview as indicated in th general admission requirements, and they must also pass the physical examination. Th results must be certified to the Director of Admissions before a permit to enter is issuec Before being eligible for admission to the College of Medicine, transfer students, in all bu exceptional cases, must complete a minimum of two semesters in residence at Urbana After admission by transfer, such students are governed by the same regulations applicabl to other students in the curriculum.

### Admission of Veterans

Veterans who entered military service prior to July 25, 1947, and have earned else where not less than eighty-six semester hours of college credit may in 1951-1952 enter th University either in the Division of Special Services for War Veterans or in any of th colleges or schools for which they have the essential prerequisites. They may qualify for admission under the entrance requirements described above or on the basis of previous work in college, graduation from high school, the passing of examinations, or other satisfactory demonstration of ability to carry college work.

## FEES AND EXPENSES

Estimated expenses for undergraduate students, exclusive of such variable items as clothing, railroad fare, and recreation, are given in the budgets

below. These budgets cover two semesters for students who are residents of Illinois. For those who are not residents of Illinois the tuition is higher.

| | *Minimum* | *Moderate* |
|---|---|---|
| Tuition and fees | $116 | $116 |
| Textbooks | 35 | 45 |
| Other school supplies | 14 | 18 |
| Room and board (which will range from $60 to $75 a month—here figured for nine months) | 585 | 720 |
| Laundry (mailed home) | 9 | 9 |
| Miscellaneous | 20 | 90 |
| *Total, Two Semesters* | $779 | $998 |

## TUITION AND FEES IN UNDERGRADUATE COLLEGES AND SCHOOLS

(Payable in full when the student registers)

**Tuition Fee.**

All students who are residents of Illinois, except those holding scholarships, pay each semester a tuition fee of ..... $ 40.00

All students who are not residents of Illinois, pay each semester a tuition fee of ..... 150.00

**Hospital and Medical Service Fee.** All students, except persons on appointment on the University staff or the staffs of the allied surveys or laboratories, and students taking not more than one unit of graduate work or five hours of undergraduate work in a semester, or one-half unit of graduate work or three hours of undergraduate work in the eight-week summer session, pay each semester, as insurance for hospital and medical service, a fee of ..... 5.00

(Note: A student who presents evidence of participation in any other group insurance system providing the same benefits as those covered by the University fee, may petition through the office of the Dean of Students for a refund of this fee.)

**Laboratory, Library, and Supply Fee.** Students taking more than eight hours of instruction, pay each semester a laboratory, library, and supply fee of ..... 8.00

(Students taking less than this amount of instruction pay $4 each semester.)

**Late Registration Fee.** Former students who register after the regular registration days in either semester pay a late registration fee of ..... 5.00

**Change Fee.** For every change slip issued later than the Saturday following registration, the fee is ..... 1.00

**Listener's Fee.** Persons not connected with the University who attend classes as listeners pay for each course each semester ..... 7.50

**Transcript Fee.** Each student who has paid all his University fees is entitled to receive, without charge, one transcript of his record. For each additional transcript the fee is ..... .50

**Special Examination Fee.** For any special examination to remove a failure the fee is ..... 5.00

**Illini Union Service Charge.** All students registering for resident work in the Urbana departments of the University, except graduate students who are members of the University staff and others who are registered for not more than one unit of graduate work or not more than five semester hours of undergraduate work, are assessed each semester an Illini Union service charge of ..... 7.00

**Activities Service Fee.** All students in the Undergraduate Division at Chicago, except those who are registered for not more than five semester hours, pay each semester a student activities service fee of ..... 6.00

**Fee for Instruction in University High School.** University students at Urbana who also register in the University High School pay, in addition to their University fees, for each half-unit each semester ..... 10.00
(Provided that the total additional charges shall not exceed $25 a semester.)

**Flight-Training Fee.** Students taking flight-training courses in the Institute of Aviation pay each semester a materials and supply fee of ..... 250.00

**Identification Card.** Each student on completing registration in each semester is given an identification card for use in obtaining loans of library books, locks, towels, and other equipment.

**Service Charge for Deferred Fees.** A service charge of 10 per cent of the amount of fees deferred, but not to exceed $3 a semester, is assessed for the privilege of deferring fees, and this charge must be paid on the day of registration. If deferred fees are paid in full within ten days after registration, the service charge is refunded *except* that a minimum service charge of $1 is retained by the University in all cases. The service charge and all charges from previous semesters must be paid on the day of registration.

**Refunds of Fees.** In case a student withdraws from a course or from the University during the first ten days of instruction, the total amount of his fees for the work dropped will be refunded. After ten days and before the middle of the semester, a rebate of one-half the fees will be made. After the middle of the semester, no rebate will be allowed. In the summer term, for students registered for eight weeks, the total amount of fees paid will be refunded if withdrawal occurs within the first five days; one-half the amount after the first five days but within the first four weeks; and nothing after the beginning of the fifth week.

## Summer Session Fees

Students registered in the eight-week summer session pay fees as listed on page 21 except that the tuition fee for residents of Illinois is $20; and for nonresidents, $75; laboratory, library, and supply fee, $4; hospital and medical service fee, $2.50; Illini Union service charge (Urbana only), $3.50; activities service fee (Chicago Undergraduate Division only), $3.

Students registering for the Summer Camp for Surveying Instruction pay a tuition fee of $20 if residents of Illinois, or $75 if nonresidents of Illinois; laboratory, library, and supply fee, $4; and hospital and medical service fee, $2.50.

## Fees for Part-Time Students

Undergraduates registering for reduced schedules pay, instead of the regular tuition fee, $3 per credit hour if a resident of Illinois, or $10 per credit hour if not a resident of Illinois; provided registration is for not more than eight credit hours in one semester or four hours in eight-week summer courses.

## Exemption from Fees for Members of the University Staff

Persons on the academic and administrative staffs of the University in any capacity, or who are on fellowship appointment in the Graduate College, or who are on permanent employment on the nonacademic staff (subject to the approval of the head of their department or division), may register in University courses for which they are eligible for admission without payment of the tuition fee and the laboratory, library, and supply fee, provided their annual salary is $2,400 or less for a nine-month appointment or $2,934 or less for a twelve-month appointment.

Permanent nonacademic employees without regard to salary may register without payment of any fees or deposits under the following conditions: (1) In any regular University course in which the employee is requested by the Department, with the concurrence of the Director of Nonacademic Personnel, to enroll for the improvement of the employee's present work. (2) Any special course looking toward improving Uni-

versity service organized at the request of the Director of Nonacademic Personnel in cooperation with the teaching staff, the employee concerned, and the department in which such employee is located.

## PROFICIENCY EXAMINATIONS

Each semester the University gives proficiency examinations, similar to the regular semester examinations, in courses normally open to freshmen and sophomores. Proficiency examinations in more advanced undergraduate subjects are given on recommendation of the head of the department and approval of the dean of the college. There is no fee charged for these examinations. A student who passes a proficiency examination is given credit toward graduation, provided that this does not duplicate credit counted for his admission to the University and that the course is acceptable in his curriculum. The grade in proficiency examinations is "pass" or "not pass," but no student is given a grade of "pass" unless he has made at least "C" in the examination. No official record is made of failures in these examinations.

Proficiency examinations are given under the following restrictions: (1) They may be taken only by persons who are in residence, or who are candidates for degrees at the close of the college year in which the examination is to be given and who need no more than ten semester hours to complete the requirements for their degrees. (2) They may not be taken by students who have received credit for more than one semester of work in the subject in advance of the course in which the examination is requested. (3) They may not be taken to raise grades or to remove failures in courses.

## GENERAL REQUIREMENTS FOR GRADUATION

A bachelor's degree is conferred on a student who satisfactorily completes a curriculum in one of the colleges or schools at Urbana, doing either the first three years or the last year of work in residence. Each candidate for a bachelor's degree must meet the general requirements of the University with respect to registration, residence, military training, hygiene, physical education, and rhetoric; must pass in the subjects which are prescribed in his curriculum; must conform to the directions of that curriculum in regard to electives and the total number of hours required for graduation; and must meet the minimum scholarship requirements which the University has approved for his college or school.

The system of grading is as follows: "A," excellent; "B," good; "C," fair; "D," poor (but passing); "E," failure. Numerical equivalents of these grades on the basis of which averages are made are as follows: "A" = 5; "B" = 4; "C" = 3; "D" = 2; "E" = 1. Examinations are conducted by the faculty at the end of each semester.

The required work includes, for men, military training, hygiene, physical education, and rhetoric; for women, hygiene, physical educational, and

rhetoric. Women entering the University as freshmen are required to obtain credit for four semesters of work in physical education and one semester in hygiene; those entering with less than fifty-six semester hours, two semesters in physical education. Hygiene is required of all students entering with less than thirty semester hours of credit. Men entering with less than fifty-six semester hours of credit are required to secure four semesters of credit in physical education including the amount transferred; those entering with fifty-six or more semester hours are exempt. Men in the freshman and sophomore classes, who are under twenty-two years of age when entering the University, are required to take basic military training (four semesters) unless exempted or excused by special regulations. Men who have earned thirty semester hours or more in the University at the Navy Pier before coming to Urbana are not required to take military.

All students entering the University as freshmen direct from secondary school are required to take a placement test in rhetoric. Those who fail to pass this test must make up the deficiency by tutoring, correspondence study, or by passing Rhetoric 100, a noncredit course meeting three hours each week. A student who fails to pass the placement test or Rhetoric 100 by the beginning of his third semester must withdraw until he does pass.

A satisfactory proficiency in the use of written English is a requirement for all undergraduate degrees awarded by the Urbana divisions of the University. In order to assure such proficiency, students who received grades of "C" or "D" in Rhetoric 102, or its equivalent, are required to take an English qualifying examination before graduating. Those who fail to pass the qualifying examination are required to pass an extra semester course in rhetoric (Rhetoric 200). A foreign student must attain the proficiency in English necessary for adequate work in his other academic courses.

In any curriculum in which less than fifteen hours of laboratory science are required, a student who enters without at least one unit of laboratory science must substitute five hours of laboratory science for five hours of electives in the requirements for graduation.

In a beginning course in a foreign language not less than a full year's work (normally eight credit hours) will be accepted toward graduation.

If a thesis is to be submitted in partial fulfillment of the requirements for a bachelor's degree, the subject must be announced by the end of the sixth week of instruction in the first semester of the student's senior year. The completed thesis on regulation paper must be presented to the dean of the proper college. The work must be done under the direction of a professor in the department concerned and must be in the line of the curriculum from which the degree is expected.

After matriculation, a student may count, toward his degree, as much as sixty semester hours of credit earned in correspondence study in subjects passed with grades of "C" or higher, under the following conditions: (1) if he completes all the remaining requirements for the degree in residence at the University; or (2) if he presents acceptable residence credit for work

done elsewhere and completes the requirements needed for his degree in residence at the University. In all such cases the senior year (of not less than thirty semester hours) must be done in residence at the University.

A student who has earned three years of residence credit at the University may do his senior year in correspondence study, subject to meeting all the requirements for his degree as announced by his college or school.

Degrees are conferred at the Commencement exercises in June and February. Students who are to complete their work for the bachelor's or the master's degree at the end of an eight-week summer term may be recommended for degrees in August.

A student who has received one bachelor's degree may receive a second bachelor's degree, provided that all specified requirements for both degrees are fully met, and provided also that the curriculum offered for the second degree includes at least thirty semester hours not counted for the first degree.

## HONORS

Students who attain a high grade of scholarship are given official recognition by the University according to the following system of honors. The plan for Honors Day is applicable to undergraduates who are enrolled in a four-year curriculum requiring only high school preparation for admission, or in the College of Education, the School of Journalism and Communications, or the Library School.

### Honors Day

Honors Day is observed annually by a convocation of students and members of the faculty, with an address by a distinguished speaker. Announcement is made of the election of students to honorary societies in which the basis of election meets a standard of scholarship approved by the Committee on Honors Day. Announcement is made also of organized groups of students whose average is equivalent to 0.20 above the average of all undergraduates on the basis of methods employed by the University authorities in determining group averages. Special recognition is given to undergraduate students who have distinguished themselves in scholarship during the two semesters previous to Honors Day (with the exception that in the case of freshmen the basis of award is the work of the first semester). Three grades of honors are awarded, as follows:

**Class Honors.** Students in the upper 10 per cent of each class within the respective schools or colleges are awarded Class Honors and are entitled to have their names printed on the Convocation program in recognition of their high scholarship, provided that no student shall be included whose average is below "B."

**College Honors.** Students in the upper 3 per cent of the sophomore, junior, and senior classes within the respective schools and colleges are awarded College Honors in recognition of their superior scholarship.

**University Honors (Bronze Tablet).** (a) Those seniors who have been in the upper 3 per cent of their class in the respective schools and colleges in the four semesters preceding Honors Day, and, therefore, have been awarded College Honors in both junior and senior years, are awarded University Honors in recognition of their sustained excellence in scholarship, and are entitled to have their names inscribed on the Bronze Tablet. (b) Other senior students who have earned College Honors twice, and whose scholastic averages for the first seven semesters are equal to or higher than the four-semester average of the lowest student currently chosen for University Honors from their college, under (a), are also entitled to have their names inscribed on the Bronze Tablet. (c) Senior transfer students who have not been at Illinois long enough to be considered under (a) or (b) are

also entitled to have their names inscribed on the Bronze Tablet, provided that: (1) their scholastic averages in the University of Illinois for the three prior semesters are equal to or higher than the four-semester average of the lowest student currently chosen for University Honors from their college under (a); and that (2) their averages in transferred credits for the year prior to their transfer are at least equal to the average of those chosen for University Honors under (a).

The awards are based on the attainments of the students as shown by the scholastic records on file in the office of the Director of Admissions and Records. The students and organizations to be given honors are selected by the University Senate through its Committee on Honors Day, and on the recommendation of the deans of the various colleges.

A student whose name is among the upper 10 per cent of his class in accordance with the foregoing plan, at the convocation held in his junior year, is permitted so to adjust the studies of his senior year as to allow him freedom to put a considerable proportion of his time on some selected subject of study or investigation under the supervision of the department concerned, provided that such arrangement does not cause omission of prescribed subjects in set curricula except by special permission of the dean of his college. In lieu of a final examination the department may require such reports or theses as it deems most suitable. The amount of approved work which may be thus taken during the senior year may not exceed the equivalent of a total of ten semester hours if taken within one department or of sixteen semester hours if in two departments. A student availing himself of the opportunity which this plan offers may not register for more than a total of eighteen hours either semester of his senior year.

## Graduation with Honors

With the approval of the University Senate and the Board of Trustees, any college or school may prescribe the conditions under which candidates for degrees may be recommended for graduation with honors. When a proposal by a college or school has thus been approved the following plan of graduation with honors ceases to apply to that division of the University. (For graduation with honors from the College of Agriculture, see page 51; the College of Fine and Applied Arts, see page 133; the College of Liberal Arts and Sciences, see page 174).

The University Senate may recommend candidates for bachelors' degrees with honors in a particular field under the following conditions:

To be considered for honors, a student must have been in residence at the University for at least four semesters, or have earned in residence at least sixty hours.

For the degree with *Honors,* the student must have received the grade of "A" in at least one-half of the semester hours accepted in satisfaction of the requirements for a major, or in a minimum of twelve hours in *approved courses in his field of specialization,* exclusive of beginning courses open to freshmen, and no grade below "C" in any of the work offered in his major or field of specialization. He must have attained a grade of not lower than "B" in at least three-fourths of all other work which he presents for graduation, exclusive of courses during his freshman year.

For the degree with *High Honors,* constituting a recognition of work of exceptional merit, the student must have received the grade of "A" in at least three-fourths of the work offered in courses accepted in satisfaction of the requirements for a major or in a minimum of fifteen hours in *approved courses in the field of specialization,* exclusive of beginning courses open only to freshmen, and no grade below "B" in the work offered in his major or field of specialization. He must also have attained a grade not lower than "B" in at least three-fourths of all the other work which he presents for graduation, exclusive of courses taken during his freshman year. In addition he must have completed satisfactorily at least ten hours in courses open to advanced undergraduate and graduate students, or courses approved for this purpose by the department in his field of specialization. He must either present an acceptable thesis or pass a comprehensive examination based on a course of study approved by that department.

The thesis or course of study in the field of specialization shall carry credit for at least four semester hours, irrespective of whether the student eventually receives *High Honors* or not; and the instructor in charge shall report to the Director of Admissions and Records a grade for each semester, based on the student's progress.

These distinctions shall be noted on the student's baccalaureate diploma and in the Commencement program, and the winners shall receive special consideration in departmental recommendation for graduate scholarships and for professional positions.

For graduation with honors in the professional schools, see the appropriate school or college bulletin.

## LIBRARIES

The University Library's resources for study and research are outstanding. Its present collections exceed 2,383,503 volumes, all except about 130,000 volumes being located in Urbana. The remainder are held by the Library of Medical Sciences in Chicago and the Library of the Undergraduate Division in Chicago.

In addition to the figures for cataloged volumes cited above, the University Library contains approximately 500,000 pamphlets, 121,000 maps, and 25,000 music scores and parts. More than 18,000 periodicals and newspapers are currently received.

Outstanding collections have been developed for a variety of fields. In the humanities, strong areas include classical literature, history, and archaeology; sixteenth and seventeenth century English literature, especially the Milton-Shakespeare period; French, Italian, and Spanish literature; German literature of the sixteenth and seventeenth centuries; and comparative philology. In the fine arts, architecture, landscape architecture, and music are noteworthy.

In the social sciences, the Library's holdings are significant for western United States history, Latin-American history of the Revolutionary period, Italian history, medieval and modern European history, German history for 1830-1900, Irish history, international law and relations, political science, law, economics, labor and industrial relations, and education.

For science and technology, collections of high rank are held in mathematics, chemistry, biological sciences (especially parasitology, entomology, and ornithology), physics, geology, engineering, and agriculture.

The Library's bibliographical facilities comprise a union catalog of more than 3,000,000 cards, representing titles owned by about two dozen major American and foreign libraries; printed catalogs of libraries, e.g., the Bibliothèque Nationale, British Museum, and Library of Congress; national and trade bibliographies of all countries for which such works have been issued; bibliographies of special subjects; and similar aids.

A number of departmental and divisional libraries are maintained. Following are the principal separately administered collections in the central library building: Classics; Commerce and Sociology; Education, Philosophy, and Psychology; English; Germanic and Romance Languages; History and Political Science; Library Science; and Physical Education. Also in the central building is a separate undergraduate library containing a general collection of over 27,000 volumes.

Elsewhere on the campus are departmental libraries for the following fields: Agriculture, Architecture and Fine Arts, Chemistry, Engineering, Journalism, Landscape Architecture, Law, Mathematics, Music, Natural History (biological sciences, geology, and geography), and Physics.

## COUNSELING SERVICES

The University makes every effort to help students through the problems of college years. At registration time, a special adviser helps the student

select and arrange his courses. The deans of the colleges, directors of the schools, heads of departments, and other members of the faculty devote a large part of their time to advising students concerning their classroom work and programs. The problems of student welfare outside the classroom are handled chiefly by three general University offices, the Director of Admissions and Records, the Dean of Students, and the Student Counseling Bureau.

The Director of Admissions and Records, through correspondence and personal conferences, provides general information about the University and specific information about admission. He is in charge of student academic records, awarding and administering undergraduate scholarships, and is chairman of the Freshman Week Committee.

The Dean of Students is in charge of most matters of student welfare and activities. As part of his organization, the Dean of Men and Dean of Women and their assistants are general advisers to whom students may turn for assistance and advice. Questions asked these advisers are extremely varied: problems of personal adjustment to campus life, what curricula to choose, how to register, how to locate suitable housing, how to find part-time employment, how to budget expenses, what loan funds and scholarships are available, questions about activities, fraternity and sorority pledging, and interpretation of University rules. The offices of these advisers are open throughout the day, and staff members are always on call for emergencies. Any student may go to them, and inquiries from parents and guardians are welcomed.

The Student Counseling Bureau provides students with the opportunity of receiving some of the best professional counseling and scientific aptitude testing services available. Through these services the student can secure information about his abilities, interests, and personality which will enable him to select more wisely a course of study and a later vocation. These services are available during the summer before he registers, and any time during his university career. The Counseling Bureau provides special help for those who can not concentrate as well, read as rapidly, or study as efficiently as they are capable of doing. The trained counselors and psychologists on the staff of the Bureau can also help with personal and psychological problems, such as over-nervousness on examinations, lack of confidence, or with other worries and conflicts which could interfere with a successful university career. Students are invited to make use of the services of the Student Counseling Bureau at any time.

## EMPLOYMENT

Students who need to work part-time while they are at the University may get information and assistance from the office of the Dean of Men. Women students who want board-and-room jobs should consult the Dean of Women.

The employment service does not guarantee to find jobs for everyone,

but there is no scarcity of opportunities. Rates vary from 60 cents to $1.50 an hour, depending on the type of work and the responsibility involved. Board jobs usually require three hours of work a day; board-and-room jobs, four hours.

Students are not advised to try to earn their total support while at the University, and freshmen are not advised to work, at least for the first semester, unless it is absolutely necessary for them to do so. If it is necessary, however, the offices of the Dean of Men or Women will assist in arranging class schedules and work which will least interfere with normal university attendance. The University recommends, however, that every new student have a cash reserve for the school year of at least $400.

## SCHOLARSHIPS

Unless otherwise stated, an undergraduate scholarship covers the tuition fee in any department of the University. For more detailed information, apply to the Director of Admissions and Records.

### SCHOLARSHIPS AWARDED BY COUNTY COMPETITIVE EXAMINATION

**County Scholarships.** One scholarship for each county in Illinois is created by statute, and sixty-six additional scholarships for Cook County have been established by the Board of Trustees. These are awarded by competitive examinations given on the first Saturday in June under the supervision of the County Superintendent of Schools. Candidates write on English (rhetoric) and on two of the following fields: mathematics, natural science, and social studies. A candidate who has had college work is not eligible.

**Agriculture and Home Economics Scholarships.** Two scholarships for each county—one for students in agriculture and one for students in home economics—are awarded to candidates ranking in the upper 50 per cent of their high school graduating class, or if one year or more of college work has been completed, averaging fifteen points above the passing grade in such work, who pass the competitive County Scholarship examination (see above).

**Scholarships for Children of Veterans of World War I and World War II.** By act of the legislature (1947) one scholarship is available in each county in Illinois each year for a child of a veteran of World War I and one each year for a child of a veteran of World War II. This scholarship is awarded to the candidate who receives the highest grade in the competitive examination held on the first Saturday in June each year as described in the paragraph on County Scholarships above except that preference shall be given to children of veterans who are deceased or disabled. It exempts the holder from the tuition fees for four years in any department of the University. Proof of service of the war veteran and of his relationship to the candidate is required.

### SCHOLARSHIPS AWARDED FOR MILITARY SERVICE

**Military Scholarships.** Acts of the General Assembly passed in 1919 and 1943 provide scholarships for veterans of World War I and World War II who, at the time of enlistment, were residents of Illinois or students in the University of Illinois. These scholarships exempt the holders from the tuition fee in any department of the University.

### SCHOLARSHIPS AWARDED ON NOMINATION OF MEMBERS OF THE GENERAL ASSEMBLY

**General Assembly Scholarships.** Each member of the General Assembly may nominate annually one student from his district for a four-year scholarship which will exempt the holder from tuition in any department of the University.

## SCHOLARSHIPS AWARDED BY THE UNIVERSITY COMMITTEE ON SPECIAL UNDERGRADUATE SCHOLARSHIPS

Applications for special undergraduate scholarships may be filed in the office of the Director of Admissions and Records after March 1 each year.

### Scholarships Good in Any College

**Alpha Phi Omega Scholarships.** From funds given annually by Alpha Phi Omega fraternity, scholarships in varying amounts are awarded to students with superior scholarship records who need financial aid.

**Campus Chest, Woman's League, and Student Affairs Scholarships.** The Campus Chest, the Woman's League, and the Committee on Student Affairs have made available funds from which annual scholarships of varying amounts are awarded.

**Foreign Students Scholarships.** The Board of Trustees has established twenty-five scholarships each year, covering the tuition fee, for students from countries friendly to the United States. Applicants for these scholarships who are from the countries of South and Central America are selected through recommendation of the Institute of International Education. Other applicants should apply to the Director of Admissions and Records of the University, who serves as chairman of the committee which selects the candidates.

**General Undergraduate Scholarships.** Scholarships are granted in varying amounts from this fund to undergraduate students. A portion of the fines paid by students for violations of University regulations and undesignated gifts for scholarships are deposited in this fund.

**John M. and Louisa C. Gregory Scholarships.** Scholarships of $100 each are available under the will of Mrs. Louisa C. Gregory, which provides that the applicants be "self-sustaining students free from the vices of smoking and chewing tobacco and from the use of intoxicating liquors." The scholarships are awarded to students who have been in residence at the University for at least one semester, on the basis of a competitive examination held in December in years when funds are adequate for at least two scholarships.

**Dunlap Harrington Memorial Fund.** Established in memory of Dunlap Harrington by his brother, this fund provides an award of $50 to a male senior in his final semester, who is financially unable to take part in the special events of that semester.

**Illini War Memorial Scholarships.** Scholarships in varying amounts are made available by the University of Illinois Foundation from gifts to the Illini Achievement Fund.

**Latin Contest Scholarships.** The winner of the annual Latin contest sponsored by the Illinois Classical Conference receives exemption from the tuition fee for one year.

**Morava Scholarships.** These scholarships are made available under the will of Wensel Morava. They are awarded annually in varying amounts.

**La Verne Noyes Scholarships.** Made available under the will of La Verne Noyes, these scholarships cover part of student fees for one year. They are open to students who served in the Army or Navy of the United States of America in World War I, or to descendants of active participants in that war.

**John C. Ruettinger Memorial Scholarship Fund.** This scholarship was established by Mr. John W. Ruettinger, of Chicago, an alumnus of the University of the class of 1927, in memory of his father. It provides annually tuition and other educational expenses for one or more worthy and needy undergraduate students.

**Phyllis Pierce Ruettinger Scholarship.** This scholarship was established in memory of Phyllis Pierce Ruettinger by her mother. Awards are made annually to junior or senior women registered at the University of Illinois, on the basis of character, scholarship, general ability, and financial need.

**John T. Rusher Scholarship Fund.** Floyd E. Rusher and Dorette J. Rusher of Peoria, Illinois, have established a trust fund in memory of their son, John T. Rusher, who died while in the service of his country. The income from this fund is used for scholarships. Awards are made on the basis of scholastic promise, character, and financial need. Other qualifications being equal, preference is given to students from Peoria or Tazewell County.

**Linsley F. Ter Bush Memorial Scholarship Fund.** The income from this fund, established by a bequest in the will of the late Mrs. Louise M. Leopold, is used for scholarships.

**University and Science Talent Scholarships.** The Board of Trustees has established for

each year twelve scholarships open to residents of Illinois and known as University Scholarships. Two of these scholarships are designated for students recommended by the Illinois State Academy of Science. These University Scholarships exempt holders from the tuition fees as required in those colleges of the University which admit students directly from high schools. A scholarship may be lapsed or forfeited if the holder fails to maintain a satisfactory record, is dismissed by the University authorities, or ceases to be a resident of Illinois.

**Manierre Barlow Ware Scholarships.** The income from a gift to the University made in memory of Manierre Barlow Ware by his mother is awarded annually to male students preferably in the College of Agriculture who are not otherwise able to provide funds for their education. The scholarships may be awarded to male students who are enrolled in or who seek to enroll in other undergraduate divisions of the University, if in the judgment of the University this is desirable.

**Wright Scholarships.** Undergraduate scholarships are made available by the gift of Harry G. and Harriette A. Wright. Awards are made to residents of Illinois on the basis of scholarship, character, and financial need. Other qualifications being equal, preference is given to applicants who express a desire and intention to prepare for work in agriculture or in fields closely related to agriculture and to applicants who reside in De Kalb, Randolph, Lee, or Whiteside County. The value of each undergraduate scholarship is $400 a year plus fees.

## Scholarships Available in Certain Courses

**Air Foundation Scholarships.** Through a gift from the Air Foundation of Cleveland, four scholarships of $250 each are awarded to students in aeronautical engineering to cover the fee for a one-semester course in flight training. Awards are made on recommendation of the Department of Aeronautical Engineering.

**Borden Scholarship in Agriculture.** The Borden Company has established a fund from which one $300 scholarship is awarded annually to a student in the College of Agriculture who at the beginning of his senior year has achieved the highest scholarship average and who has completed two or more courses in dairy science.

**Borden Scholarship in Home Economics.** The Borden Company has established a fund from which one $300 scholarship is awarded annually to a student majoring in home economics who upon entering her senior year has achieved the highest scholarship average and who has completed two or more courses in foods and nutrition.

**Chicago Farmers Scholarship in Agriculture.** One scholarship of $500 each year is awarded to a junior in agriculture for use during his senior year. The award is made by the Committee on Special Undergraduate Scholarships on recommendation of the Scholarship committee of the College of Agriculture.

**Illinois Rural Youth Community Service Scholarships in Agriculture and Home Economics.** From funds given by the Gulf, Mobile, and Ohio Railroad Company, seven scholarships in agriculture and home economics are awarded each year to students living in the thirty counties served by this railroad that have had the best programs on Rural Youth Community Service during the past year. The scholarships range in value from $250 to $400. Applications may be filed with the Dean of the College of Agriculture. All applications must be approved by the County Farm Adviser and must be accompanied by a thousand-word essay on "The Railroad Industry." Awards are made by the Committee on Special Undergraduate Scholarships on recommendation of the Dean of the College of Agriculture.

**Kroger Scholarships in Agriculture and Home Economics.** Through a gift from the Kroger Grocery Company three scholarships in agriculture and three in home economics are awarded each year to freshmen by the Committee on Special Undergraduate Scholarships on recommendation of the scholarship committee of the College of Agriculture. These scholarships have a value of $200 each.

**National Association of Thoroughbred Breeders Scholarships in Agriculture.** A fund for scholarships in agriculture has been given by the National Association of Thoroughbred Breeders. Awards are made to freshmen on the basis of high school records, evidence of leadership, financial need, and active participation in the Future Farmers of America organization. The awards are $200 for the freshman year and $100 each for the sophomore and junior years. Applications should be made to the Dean of the College of Agriculture.

**Sears-Roebuck Scholarships in Agriculture and Home Economics.** A fund to aid freshman and sophomore students in the College of Agriculture has been made available through a gift of the Sears-Roebuck Foundation. Awards are made to students whose high school and other records show promise of superior attainment and who need financial assistance. Applications are filed in the Office of the Dean of the College of Agriculture. An award to a freshman is normally $200 for the first year.

**United Spanish War Veterans Auxiliary Scholarship in Home Economics.** Fifty dollars annually is awarded to a student in home economics at the end of the freshman year, on recommendation of the Department of Home Economics on the basis of scholarship, qualities of leadership, and financial need.

**Ceramic Scholarships.** Ten two-year scholarships, covering the tuition fee, are available each year. These scholarships are financed by industry through the Ceramic Scholarship Trust Fund. Awards are made by the Committee on Special Undergraduate Scholarships. Recommendations of the Department of Ceramic Engineering are considered in selecting the candidates.

**Illuminating Engineering Scholarships.** Two scholarships of $250 each per year are made available by a gift of the Illuminating Engineering Society (Chicago Section). One scholarship is awarded to a junior and one to a senior in the illuminating engineering option of electrical engineering. The awards are made by the Committee on Special Undergraduate Scholarships on the recommendation of the teaching staff in illuminating engineering. A candidate must be a citizen of the United States, must have completed one full semester in the University with a superior scholarship record, and must give promise of being successful in his chosen profession.

**Frederick D. Secor Memorial Scholarships in Electrical Engineering.** A bequest in the will of the late Bessie Secor, in memory of her father, provides scholarships for students in electrical engineering.

**John Morse Memorial Scholarships in Engineering.** Three scholarships for juniors and three for seniors are awarded from funds given by the John Morse Memorial Foundation. Each scholarship is $500 a year. First preference is given to students in mechanical engineering and second preference to students in electrical engineering. Awards are made by the Trustees of the Foundation on recommendation of the College of Engineering and the Committee on Special Undergraduate Scholarships.

**Mining Engineering Scholarships.** Funds have been received from various donors to provide scholarships for students in mining engineering. These scholarships are awarded by the Committee on Special Undergraduate Scholarships on the recommendation of the Department of Mining and Metallurgical Engineering. In certain instances, preference is given to employees or children of employees of the donor. These scholarships have a value of $200 a year. Funds have been received from the Illinois Mining Institute, Old Ben Coal Company, Peabody Coal Company, and Sahara Coal Company. Sahara Coal Company scholarships are also available for graduate study in mining engineering.

**Alfred E. Pickard Scholarship in Engineering.** This scholarship, worth $200, is awarded to a worthy student in the College of Engineering, preferably a student in mining engineering, who needs financial aid. The award is made by the Committee on Special Undergraduate Scholarships on recommendation of the Department of Mining and Metallurgical Engineering.

**Skidmore, Owings, and Merrill Scholarship in Architecture.** From funds provided by the architectural firm of Skidmore, Owings, and Merrill, one scholarship of $1,000 is awarded to an outstanding student in architecture who is about to begin his final year of undergraduate study. The award is made by the Committee on Special Undergraduate Scholarships on recommendation of a Committee in the Department of Architecture.

**Lydia E. Parker Bates Scholarships in Fine Arts.** Available in varying amounts to undergraduate and graduate students in art, architecture, architectural engineering, and landscape architecture. Awarded on recommendation of a committee of the faculty of the College of Fine and Applied Arts.

**Journalism Alumni Memorial Scholarship.** Fifty dollars annually is awarded to a junior in the School of Journalism and Communications, payable at the beginning of his senior year. The award is made on recommendation of the faculty of the School of Journalism and Communications on the basis of scholarship, character, aptitude in journalism, and other related qualities.

**Elizabeth Hamilton Scholarship in Medicine.** A scholarship of $500 a year is made

available by Miss Helen M. Russell to a man in the premedical curriculum. It may be renewed from year to year through the medical course if the holder maintains a superior scholarship record.

**Elizabeth Hamilton Scholarship in Music.** A scholarship of $500 a year is made available by Miss Helen M. Russell to a woman student in the School of Music, preferably a piano major.

**William Anderson Scholarships in Music.** The income from a gift by Mrs. Margaret Anderson, in memory of her late husband, provides scholarships for needy and talented students registered in the School of Music. The awards are made by the Committee on Special Undergraduate Scholarships on recommendation of a committee of the faculty of the School of Music.

**Sinai Temple of Champaign-Urbana Scholarship in Music.** A scholarship of $50 was established in 1943 by the Sinai Temple of Champaign-Urbana. It is awarded annually, on recommendation of a faculty committee of the School of Music, to an upperclass student in music, on the basis of scholastic excellence, natural ability, and financial need.

**Thomas J. Smith Scholarships in Music.** Four scholarships are available annually for women, preferably from Champaign County. These are awarded to students who are unable to pay the customary fees for instruction in music, on the basis of comparative promise as judged by a committee of the School of Music.

**Illinois Federation of Women's Clubs Scholarships in Occupational Therapy.** Through the gifts of the state organization and the third congressional district of the Illinois Federation of Women's Clubs, funds are available for a limited number of scholarships for properly qualified and deserving students in occupational therapy.

**Lois Shepherd Green Scholarships in Philosophy.** A scholarship fund has been established by Frederick Green, Professor of Law, Emeritus, in memory of his wife. The income is to be used for scholarships to undergraduate students on recommendation of the faculty of the Department of Philosophy.

**Lou Boudreau Scholarships.** Through the Lou Boudreau Trust Fund, scholarships covering tuition and fees have been established and are available to male graduates of Thornton Township High School who rank in the upper 50 per cent of their class. Candidates must be outstanding in one or more extracurricular activity, and must possess qualities of leadership, good character, and good habits. Awards are made by the Committee on Special Undergraduate Scholarships from candidates recommended by the local committee.

**Robert C. Zuppke Scholarships in Physical Education.** Through a gift two scholarships have been established for male students in the general curriculum in physical education who are residents of Illinois. Each scholarship covers tuition and fees for four years. Awards are made by the Committee on Special Undergraduate Scholarships on recommendation of the executive committee of the School of Physical Education.

**Illinois Congress of Parents and Teachers Scholarships.** Three scholarships each year, of a value of $200 each, are made available by the Illinois Congress of Parents and Teachers. Applicants must be graduates of Illinois high schools maintaining local units of the Illinois Congress of Parents and Teachers and must be preparing to teach. The Congress has also given funds for scholarships for students preparing to teach deaf or mentally handicapped children.

### OTHER UNDERGRADUATE SCHOLARSHIPS

**William J. Cook Fund Scholarships.** A number of scholarships are available to young men who are graduates of Cook County high schools, under a bequest made by Mr. William J. Cook in 1940. Applications should be filed with the Chicago Community Trust, 10 South LaSalle Street, Chicago. High school seniors should apply not later than April 15; college students not later than May 15.

## LOAN FUNDS

The following loan funds have been established for the benefit of worthy students of the University who are in need of financial aid. Loans are not ordinarily made to students during their first year at the University. Each

application must be approved by the Dean, Director, or Assistant Dean of the college or school in which the student is registered, by the Dean of Students, the Dean of Men, or the Dean of Women, and by the Comptroller; in case of disagreement among these officers the application will be submitted to the Chairman of the Finance Committee of the Board of Trustees. Security in the form of a qualified endorser or collateral satisfactory to the Comptroller is required for all long-term loans unless otherwise provided in the deed of gift of the fund or waived in meritorious cases, as determined by the Dean of Men or the Dean of Women and the Comptroller. Application blanks may be obtained from the offices of the Bursar, the Dean of Men, and the Dean of Women.

**Dora E. Biddle Loan Fund for Girls.** This fund was derived in 1919-1920 from two gifts by Mrs. Dora E. Biddle of Macon, Illinois. Preference is given those women students most advanced in their University work.

**Carter-Pennell Loan Fund.** Donated by the Late Joseph Carter and his wife, Jane Pennell Carter, in 1923. Loans may be made to any student of sophomore standing in the Colleges of Engineering and Agriculture, or to any student in the College of Liberal Arts and Sciences who is specializing in science.

**Champaign Business and Professional Women's Club Loan Fund.** Presented to the University on October 8, 1940. Loans from this fund are made to deserving women students.

**Chicago Illinae Club Fund.** Established by the Chicago Illinae Club especially for women students of the University.

**Raymond Clamage Memorial Fund.** Presented August 5, 1947, by Mr. and Mrs. Edward Clamage as a memorial to their son, Lieutenant Raymond Clamage. Loans may be made only to students on the *Daily Illini* staff.

**Class of 1907 Loan Fund.** Presented to the University on June 11, 1932, this fund is used for the making of loans to students under general rules of the Board of Trustees governing loan funds, with no restrictions except that preference be shown to lineal descendants of members of the class.

**Consolidated Loan Fund.** This fund results from the merger of the Automobile Show Fund, the Class of 1895 Loan Fund, the Graduate Club Loan Fund, and the Student Friendship Fund.

**Grace Darling Memorial Fund.** Founded by Mrs. R. V. Cram, of Minneapolis, in 1922. Operated under the regulations of the Edward Snyder Fund described below.

**Louis Edward Dawson Memorial Fund.** A gift from Mrs. Edward Dawson, accepted November 23, 1945, as a memorial to her son, Louis Edward Dawson. The fund is for aiding worthy students in chemistry.

**Denison Memorial Fund for Worthy Seniors.** The late Charles A. Denison, of Argenta, bequeathed this fund to be used for loans to worthy senior students on recommendation of the President and Treasurer of the University.

**Detroit Illinae Club Loan Fund.** Established May 11, 1932, as a gift from the Detroit Illinae Club.

**Harry J. Diffenbaugh Trust Fund.** The late Harry J. Diffenbaugh, of the Class of 1882, established a trust fund, the income of which is used for loans to worthy and needy students who are residents of the State of Missouri attending the University of Illinois. Applications for loans may be made to the Dean of Men of the University of Illinois or to the First National Bank of Kansas City, Missouri, the administrators of the trust fund.

**Electrical Engineering Loan Fund.** Established by the Electrical Engineering Society and maintained by the Student Branch of the American Institute of Electrical Engineers, this fund includes income from the electrical shows and is available for juniors and seniors in good standing in the curricula in electrical engineering and engineering physics.

**Engineering Student Loan Fund.** The residual assets of the Real Co-operative Company (formerly the Engineering Co-operative Society) were accepted by the University in

1936 for the purpose of establishing a loan fund for the benefit of students in the College of Engineering.

**James Wilford Garner Memorial Fund.** Presented to the University June 24, 1941, this fund is used for loans to worthy students in political science.

**Samuel and Lydia Hare Student Loan Fund.** The late Samuel Hare, of Piper City, bequeathed this fund (accepted by the Board of Trustees October 15, 1937) for loans to students who have by previous study demonstrated their worthiness.

**Mary Trowbridge Honey Loan Fund.** A bequest of the late Mary Trowbridge Honey, of Wayne, Nebraska, accepted by the Board of Trustees May 16, 1942, for loans to students in the Department of Classics.

**Margaret Lange James Student Loan Fund.** Established by a gift from President E. J. James in 1914 and increased by the University Senate as a memorial to him. Loans may be made to students, preferably women, who have been in residence at least one year, have attained junior standing, and expect to graduate.

**A. F. Kaeser Student Loan Fund.** A gift from Dr. A. F. Kaeser, of Highland, Illinois, accepted on September 30, 1939, by the Board of Trustees. Graduates of high schools located in Highland, Illinois, are to be given preferential consideration for loans from this fund. If this loan fund is not exhausted through loans made to these graduates, loans may be made to graduates of high schools located in the counties of Madison, Bond, and Clinton. Loans made to any one student shall not exceed $200 annually or $800 for the four-year period.

**Kappa Delta Pi Student Loan Fund.** Accepted by the Board of Trustees June 15, 1935, as a gift from Alpha Chapter of Kappa Delta Pi. Available only to worthy seniors in the College of Education.

**Willis Prentice Kimble Loan Fund.** A memorial fund established by Mrs. Kimble in 1929. Loans may be made to sophomores, juniors, and seniors, but not in excess of $100 to any one individual.

**William E. Levis Loan Fund.** Established in 1936 by a gift from William E. Levis of the Class of 1913, President of the Owens-Illinois Glass Company. Loans will be made (1) to employees or children of employees of the Owens-Illinois Glass Company and its affiliated companies or subsidiaries, who are students in attendance or prospective students expecting to register immediately at the University; and (2) if funds are available, to students who have been in attendance at the University for at least one year, under the general regulations governing loan funds.

**William B. McKinley Loan Fund.** This fund is made up of several donations from the late Senator William B. McKinley, the gifts having been made between 1912 and 1926. Loans may be made to male students who have been in residence at least one year and intend to graduate.

**J. R. Morris Loan Fund.** Donated by the late Joseph R. Morris, of Anne Arundel County, Maryland, in 1922. Loans are made to students who have been in residence at least one semester. Preference is given to students who are advanced in University work.

**Loan Fund for Overseas Soldiers.** Originally donated in 1919, with an addition in 1924, this fund is available to soldiers, sailors, and marines with overseas service, and to their descendants. Qualifying students in the junior, senior, or postgraduate years are eligible, or students in any year in the College of Agriculture.

**C. W. Parmelee Fund.** Presented March 11, 1948, by friends of Professor Cullen W. Parmelee, for loans to students in ceramic engineering.

**William T. Rogers Loan Fund.** Established April 10, 1948, by bequest of William T. Rogers, for loans to deserving students in need of financial assistance.

**Marcus Russell Loan Fund.** Donated by the late Marcus Russell, of Los Angeles, California, in 1926, "The proceeds from this fund shall be used as a fund to be loaned to worthy and indigent students."

**Edward Snyder Fund.** This fund was established in 1899 by the late Edward Snyder, Professor of German in the University. Loans may be made to students of junior standing who are in residence and expect to graduate. Preference is given to those of high rank and advanced standing, but no distinction is made as to sex or course of study.

**Henry Strong Educational Foundation.** The Henry Strong Educational Foundation,

established at Chicago under the will of General Henry Strong, provides for loans to students under the age of twenty-five years, preferably in the upper classes.

**St. Louis Illinae Club Loan Fund.** Established March 29, 1937, as a scholarship loan fund.

**Harry Roberts Temple Fund.** Established in 1924 by Mrs. Frieda Block Temple. The regulations of the Edward Snyder Fund apply except that preference is given to students in the Department of Architecture.

**Woman's Athletic Association Loan Fund.** Established September 28, 1932, this fund is available to women students during the senior year.

**Woman's League Fund.** Established by the Woman's League in 1911. This fund is administered under the regulations of the Edward Snyder Fund.

### Emergency Loan Funds

Emergency loan funds are available in small amounts for short periods only. In the Urbana departments the approval of the Dean of Men or Dean of Women and the Comptroller are required. In the Chicago Undergraduate Division, the approval of the Dean of Students is required.

**Cora C. Bright Memorial Loan Fund.** A gift from the Illinois Congress of Parents and Teachers in 1939, for emergency loans to students at Urbana.

**Class of 1932 Fund.** Presented to the University on June 15, 1934, through the Alumni Association, for emergency loans to students at Urbana.

**Verne Hall Detweiler Loan Fund.** A gift from the Illinois Congress of Parents and Teachers in 1936, for emergency loans to students at Urbana.

**Edward C. Heidrich, Jr., Loan Fund.** Established in 1944 by a gift from Edward C. Heidrich, Jr., this fund is for emergency loans to students at Urbana.

**Thomas L. Seanor Memorial Fund.** This fund was presented November 1, 1945, by Lieutenant Harry F. Seanor as a memorial to his brother, Lieutenant Thomas L. Seanor.

**Irene Symonds Loan Fund.** A gift from the Illinois Congress of Parents and Teachers, accepted November 8, 1943, as a memorial to Irene Symonds. The fund is for emergency loans to students at Urbana.

**Tau Delta Tau Loan Fund.** This fund was presented November 1, 1945, by Tau Delta Tau fraternity as a memorial to two of its members, John Donald Danielson and Joel Hubbard Rossiter.

**University Faculty Emergency Loan Funds for Students.** Established in 1932-1933, these funds represent a portion of the money set aside for emergency loans to students at Urbana from funds solicited in 1931 by the University Senate Committee on Unemployment and Relief.

## PRIZES AND AWARDS

Competitive prizes, scholarships, fellowships, and miscellaneous awards, which are offered to students in the University, are classified here as follows: (1) those authorized by the Board of Trustees; (2) those awarded by local organizations; and (3) those not limited to students at the University of Illinois, but offered at other schools as well. The following lists are subdivided according to the colleges, schools, or departments conducting the competitions.

### PRIZES AUTHORIZED BY THE BOARD OF TRUSTEES

#### General Competitions

**Bryan Prize.** In 1898 Mr. William Jennings Bryan gave to the University the sum of $250, from the interest on which a prize of $50 is offered for the best essay on a topic

relating to the science of government. The contest is open to all undergraduate students. The essays may not be less than 3,000 nor more than 6,000 words in length, and they must be left at the office of the Department of Political Science not later than the second Wednesday in May. It is suggested that the essays be on some phase of American government and that contestants confer with the Department of Political Science as to the selection of a topic. The prize is ordinarily offered every fifth year. It will be offered next in 1953.

**English Poetry Prize.** The Department of English offers a prize of $25 for the best undergraduate poem or group of poems of the year. The award may be withheld in any year if no entry is found worthy of a prize.

**Thacher Howland Guild Memorial Prize.** The Department of English offers a prize of $25 for the best undergraduate play of the year. The award may be withheld in any year if no production is found worthy of a prize.

**Thrift Essay Prize.** The income from a fund established in 1918 by the committee for the sale of War Savings Stamps in Illinois is available for prizes for essays on thrift. Any student in the University who has had a course in the principles of economics is eligible to compete. The essays deal with some aspect of thrift, as designated by the Chairman of the Department of Economics, who is in charge of the contest.

## College of Engineering

**Ira O. Baker Prizes.** The late Dr. Ira O. Baker, Professor of Civil Engineering, Emeritus, endowed two prizes for the two ranking senior students in civil engineering. These prizes, amounting to $75 and $25, respectively, are awarded primarily on excellence of scholarship and secondarily on personal qualities and professional activity. The names of the winners in each year are placed on a bronze tablet located near the office of the Department of Civil Engineering, and a special certificate is given to each winner.

## College of Fine and Applied Arts

**Allerton American Traveling Scholarships.** For the past several years Mr. Robert Allerton has given the Department of Architecture the sum of $800 to be used during the summer "for a trip through New England by the two juniors who stood best in the junior class in the History of Architecture" for the year. This award enables these students to study early American architecture on the Atlantic seaboard.

**American Institute of Architects Prizes.** The American Institute of Architects awards annually a medal and a book to the senior in architecture whose development during his undergraduate career is the most consistent and best, and a book to the senior in architecture who ranks second.

**Edward C. Earl Prizes.** Income from an endowment bequeathed by the late Edward C. Earl is used for two prizes for students in architecture showing the highest excellence and progress in the courses in materials and methods of construction.

**Grunsfeld European Traveling Fellowship.** An award of $500 toward travel and study in Europe is available to graduates of the curriculum in architecture during the calendar year preceding the award.

**Kate Neal Kinley Memorial Fellowship.** This fellowship was established in 1931 to promote advanced study in the fine arts, in memory of the wife of a former president of the University and in recognition of her influence in promoting these and similar interests. This fellowship enables a graduate of Illinois, or some similar institution of equal educational standing, to pursue advanced study for one year at home or abroad. This fellowship is not open to students of architectural construction, city planning, or landscape architecture. The award is made annually under the direction of the College of Fine and Applied Arts.

**Mary C. McLellan Scholarship in Art.** Established by bequest of the late Mary C. McLellan of the class of 1888, and accepted by the Board of Trustees in 1942, this scholarship is awarded as funds warrant under the direction of the Department of Art. It is open to graduates of the University who have demonstrated unusual excellence in art and have given promise of professional success. The stipend is to be used for professional

development through travel in America or abroad, or for study at a recognized institution or with a qualified private master.

**Plym Fellowships in Architecture and Architectural Engineering.** The late Francis J. Plym, a graduate of the class of 1897, endowed two fellowships, one in architecture and the other in architectural engineering, with stipends of $1,200 each. The winners ordinarily are required to spend a year in study abroad.

**Plym Prizes.** Through endowment by the late Francis J. Plym, the Department of Architecture offers annually certain prizes for undergraduate work. The prizes in architectural engineering represent three awards to those senior architectural engineers whose work, attitude, and ability are judged the highest. The prize for summer sketches is awarded to the student who, during a summer vacation, makes the most interesting and best freehand sketches. The prize for sketch problems is offered as a stimulation for the better development of sketch problems during the year.

**Richard F. Voynow Prize in Music.** Through a gift from Colonel Edward E. Voynow, of New York City, a prize of $50 is awarded annually to the student enrolled in the School of Music who submits the best essay on a subject selected by the Director of the School of Music, preference to be given to a subject dealing with some phase of modern popular music.

**James M. White Memorial Prize.** Income from the James M. White Memorial Fund is used for a prize for the graduate student in architecture who shows the highest excellence in graduate studies.

## College of Law

**Harker Prizes.** The late Judge O. A. Harker, Professor of Law, Emeritus, who was Dean of the College of Law from 1903 to 1916 and again in 1920-1921, endowed two annual prizes: the annual income on $2,000 to the senior making the highest average grade in law subjects for the three years in which he was registered; and the annual income on $1,000 to the junior making the highest average grade in law subjects for the two years in which he was registered.

## Department of Military Science and Tactics

**Hazelton Medal.** In 1890 Captain W. C. Hazelton provided a medal which is awarded to the best-drilled freshman in the elementary course. Each competitor must have been in attendance at the University at least sixteen weeks of the current college year and have had not more than one unexcused absence from drill. To be eligible for this award, a student must have a grade of "B" in military science and he must have an academic average of not lower than "C" in his first semester courses. Competition is normally held in March and April. The successful competitor retains possession of the medal until the date of the final competition of the following year.

**University Gold Medal.** The Trustees annually provide a gold medal to be awarded to the best-drilled second-year elementary course student. To be eligible for this award, a student must have completed three semesters of work in military science with a grade not lower than "B"; and he must have an average standing not lower than "C" in all his other studies for the preceding semester. Competition is normally held in March and April.

**Chicago Tribune Awards for Military Merit.** The *Chicago Tribune* awards a gold and a silver medal each semester to the two sophomores most outstanding scholastically. The cadet with an "A" in military science and the highest academic average for the semester will be declared the winner of the gold medal, and the student second highest, the winner of the silver medal. In case of ties, the one with the highest numerical grade in military science for the semester will be the winner. If this does not break the tie, previous semester averages will be considered, and the one with the highest cumulative academic average will be the winner. If this does not break the tie, they will be declared co-winners, and the medal awarded by lot.

## PRIZES AWARDED BY ORGANIZATIONS AT THE UNIVERSITY

### General Competitions

**Alpha Lambda Delta Prize.** The national organization of Alpha Lambda Delta, honorary society for freshman women, offers annually a book to the senior woman who in her freshman year was elected to Alpha Lambda Delta and who has maintained the highest scholastic average of the Alpha Lambda Delta graduating seniors.

**Chi Omega Prize.** The University of Illinois Chapter of Chi Omega offers annually a prize of $25 to the senior woman who has consistently done the most outstanding work in the field of sociology.

**Thomas Arkle Clark Prize.** The freshman honorary society, Phi Eta Sigma, gives each year a prize of $25 to the sophomore member of Phi Eta Sigma who has attained the highest scholastic average for his first three semesters in the University. This prize is awarded as soon as possible after the grades are available for the first semester. In case two men have the same average, other factors are considered, such as extracurricular activities and outside work.

**Phi Kappa Phi Awards.** The local chapter of Phi Kappa Phi, national honor society, gives two or more awards annually for graduate study to members of the local chapter who are graduates of the University or members of the graduating class, selected on the basis of scholastic record and promise of success in graduate work. Applications should be addressed to the local secretary of the society early in the second semester.

### College of Agriculture

**Alpha Zeta Award.** Each year the name of the freshman in the College of Agriculture who makes the highest grade average for both semesters is inscribed on the Alpha Zeta plaque.

**Gamma Sigma Delta Prize.** Each year the senior in the College of Agriculture who ranks highest in scholarship, on the basis of a minimum of four semesters of work in residence in the University, has his name inscribed on the Gamma Sigma Delta plaque in the Agriculture Library.

**Home Economics Club Award.** Each year the name of the freshman in home economics who makes the highest average is engraved on a plaque provided by the Home Economics Club.

**Omicron Nu Plaque.** Each year the name of the senior in home economics who ranks highest in scholarship is inscribed on the Omicron Nu plaque which hangs in Bevier Hall.

### College of Commerce and Business Administration

**Alpha Kappa Psi Scholarship Medallion.** Epsilon Chapter of Alpha Kappa Psi, a professional fraternity in commerce, awards annually a scholarship medallion to the male student pursuing a curriculum in the College of Commerce and Business Administration who has attained the highest scholastic average for three years of collegiate work in the University. The name of the winner is engraved on a scholarship tablet on display in the college office.

**Beta Gamma Sigma Cup.** Beta Gamma Sigma annually honors the freshman in the College of Commerce and Business Administration who makes the highest average in the first semester's work. The name of the winner is engraved on a silver cup on display in David Kinley Hall.

**Delta Sigma Pi Key.** The Illinois Chapter of Delta Sigma Pi professional fraternity annually awards a key to the male student graduating from the College of Commerce and Business Administration with the highest four-year scholastic average.

**Phi Chi Theta Key.** The professional sorority, Phi Chi Theta, awards a key each year to the woman in the junior class in the College of Commerce and Business Administration who ranks highest in the estimation of a committee composed of three members of the faculty and one member of the sorority. Scholastic records, extracurricular activities, and promise of success in business are considered.

## College of Education

**Kappa Delta Pi Award.** Alpha Chapter of Kappa Delta Pi offers annually an award of $10 to an outstanding senior in the College of Education. The award is granted to a student of high character who has exhibited unusual proficiency in practice teaching and who has attained superior scholarship in his field of specialization and high scholarship in all his University work. The name of the recipient is engraved on a plaque hung in the office of the Dean of the College of Education.

## College of Engineering

**American Society of Civil Engineers Awards.** Junior membership for one year in the American Society of Civil Engineers, including the badge of the society and an embossed certificate of award, is presented each year by the Illinois Section of the society to one graduating civil engineer and by the Central Illinois Section to two graduating civil engineers and to one graduating non-civil engineer who have attained high scholarship averages and who have been active in promoting the affairs of the student chapter at the University.

**American Society of Mechanical Engineers Awards.** The Central Illinois Section of the society awards two prizes of $10 and $15 annually for the best papers prepared by senior student members of the society at Urbana.

## College of Fine and Applied Arts

**Alpha Rho Chi Medal.** Alpha Rho Chi, national architectural fraternity, provides a bronze medal each year to the Department of Architecture, to be awarded to a senior who has shown ability for leadership and given promise of professional merit.

**Ricker Prize.** Gold keys are awarded annually for the three best essays on some phase of the history of architecture by students registered in the second year of work in this subject. This prize is given by Anthemios Chapter of Alpha Rho Chi in recognition of the distinguished contributions made by the late Dr. Nathan Clifford Ricker, who for fifty years taught the history of architecture in the University.

**Scarab Medals.** Scarab, architectural fraternity, offers annually several bronze medals as follows: (1) for freehand sketching open to all students in architecture; (2) for outstanding work in freshman architectural design; (3) for the best solution of the first major second-semester problem in sophomore design; (4) for the highest award on the second major second-semester problem in junior design; (5) to the student in architectural engineering with the highest record made in freshman and sophomore design.

**Pi Kappa Lambda Award.** The initiation fees of Pi Kappa Lambda, national honorary music fraternity, are awarded annually to the senior student in music who has the highest scholastic average.

## School of Journalism and Communications

**Alpha Delta Sigma Plaque.** Alpha Delta Sigma, national professional advertising fraternity, selects and recognizes the outstanding junior in the School of Journalism and Communications each year. The selectee's name is engraved on a wall plaque for permanent display in Gregory Hall.

**St. Louis Advertising Club Award.** An all-expense trip to St. Louis, Missouri, for one week is awarded to two seniors in advertising, one man and one woman, as guests of the St. Louis Advertising Club. Selection is by the faculty of the School of Journalism and Communications as a recognition of achievement and promise in the profession of advertising.

**Sigma Delta Chi Certificates.** Each year the national journalism fraternity, Sigma Delta Chi, awards certificates to the upper 10 per cent of the graduating class in the School of Journalism and Communications. Also a special citation of achievement is awarded to the outstanding man in the class, selected on a basis of scholarship, character, and journalistic competence.

**Theta Sigma Phi Award.** The outstanding woman in the graduating class is selected

each year by Theta Sigma Phi, woman's professional journalism fraternity, and is awarded a certificate of achievement.

## College of Law

**Frederick Green Moot-Court Competition Award.** The Horner Chapter of Nu Beta Epsilon, law fraternity, has presented to the University a gold cup on which is inscribed each year the name of the student in the College of Law who places first in the Frederick Green Moot-Court Competition.

## College of Liberal Arts and Sciences

**Alpha Chi Sigma Plaque.** Zeta Chapter of Alpha Chi Sigma, chemical professional fraternity, has hung a plaque in the Chemistry Library as an award to high scholarship in the freshman class. Each year the name of the man who attains the highest scholastic average for his first semester of work in the curriculum of chemistry or chemical engineering is engraved on the plaque.

**Iota Sigma Pi Prize.** A cash prize of $20 is awarded each year by the honorary chemical sorority, Iota Sigma Pi, to the woman in the senior class who has the highest scholastic average in her University work with chemistry as her major subject.

**Omega Beta Pi Scholarship Award and Trophy.** A cash prize of $25 is awarded each year by the honorary premedical fraternity, Omega Beta Pi, to the student who has shown the highest excellence in the physical sciences during his first three semesters in the premedical curriculum. Omega Beta Pi also awards a trophy at the end of the first semester each year to the freshman premedical student making the highest scholastic average.

**Phi Beta Kappa Scholarship.** The University of Illinois Chapter of Phi Beta Kappa awards a scholarship of $80 annually to a member of the junior class of the College of Liberal Arts and Sciences, selected on the basis of general merit. The scholarship is available to the winner during his senior year at the University of Illinois.

**Phi Lambda Upsilon Cup.** Alpha Chapter of Phi Lambda Upsilon, honorary chemical society, awards a cup annually to the sophomore man who has the highest scholastic average among the students in the curricula of chemistry and chemical engineering. The cup is on display in the main hall of the Chemistry Annex.

**Phi Sigma Medal.** The national organization of Phi Sigma, honorary biological society, awards annually a silver medal to the undergraduate student presenting the best report or evidence of the most original research on a biological subject.

**Doctor Abram Leon Sachar Prize in History.** This prize is made available through an annual gift of $100 from the Women's District Grand Lodge Number Six B'nai B'rith. The prize is awarded by the Department of History to the senior who has the highest scholastic average among graduating seniors who have majored in history.

## Department of Military Science and Tactics

**American Legion Medals.** The American Legion, Department of Illinois, awards medals to the retiring Cadet Regimental S-1, S-2, S-3, and S-4 for superior attainment.

**American Legion Auxiliary Awards.** The Illinois Department of the American Legion Auxiliary makes an award of $50 to each of the three retiring Cadet Battalion Commanders for superior attainment.

Unit No. 24 presents an award of $10 to the runner-up in the competition for the Hazelton Medal.

Unit No. 71 presents an award of $25 to the runner-up in the competition for the University Gold Medal.

**Armed Forces Communication Association Award.** A medal is presented to the outstanding cadet in the Signal Corps Unit who is majoring in communications and electronics.

**Armor Unit Medal.** The best-drilled Basic Course cadet in the Armor Unit receives a medal.

**Coast Artillery Association Medal.** A medal is given to the outstanding senior Anti-aircraft Artillery cadet.

**Daughters of the American Revolution Prize.** A saber is presented to the new Cadet Colonel for superior attainment.

**Daughters of Union Veterans of the Civil War Medal.** A medal and $10 are awarded by the Daughters of Union Veterans of the Civil War, Department of Illinois, to the outstanding advanced course member of the Rifle Team who has contributed most toward the promotion of rifle marksmanship at the University of Illinois.

**Fifth Army Awards.** Medals and plaques are presented to the ten highest members of the Rifle Team winning first place in the Fifth Army Area Senior ROTC Intercollegiate Rifle Match.

**Illinois Society of the Sons of the American Revolution Medals.** All retiring company and battery commanders receive medals for superior attainment.

**National Defense Transportation Association Prizes.** The Association presents a scroll citation and a gold-filled key and chain to the outstanding senior Transportation Corps cadet. The most outstanding junior Transportation Corps cadet is presented a scroll citation.

**Ordnance Association Medal.** The outstanding Junior Ordnance cadet is presented with a medal.

**Phalanx Awards.** This organization awards to the outstanding freshman of each branch a plaque and bars for general excellence.

**Quartermaster Association Awards.** A key is presented to the outstanding senior Quartermaster cadet and a medal to the outstanding junior Quartermaster cadet.

**Reserve Officers' Association Medal.** The Champaign County Chapter of the Reserve Officers' Association presents an award to the retiring Cadet Colonel for superior attainment.

**Scabbard and Blade Prizes.** Bars are presented to the outstanding sophomore in each regiment for general excellence.

**Society of American Military Engineers Medal.** The Society presents a medal to the most outstanding Engineer Cadet with one year remaining before graduation.

**Sons of Union Veterans of the Civil War Auxiliary Prize.** A saber is presented to the senior cadet, other than the Cadet Colonel of the Army R.O.T.C., who has contributed most to the Cadet Corps.

**United Spanish War Veterans Auxiliary Prize.** Fifty dollars is presented to the winner of first place in rifle marksmanship.

**Veterans of Foreign Wars of the United States Awards.** A watch, a silver medal, and a certificate of merit are presented annually to the retiring Cadet Colonel and the Cadet Regimental Executive Officer for superior attainment.

**Veterans of Foreign Wars of the United States Auxiliary Awards.** The award of the Pershing Rifles Medal and a $25 government bond is made to the junior in Pershing Rifles demonstrating the most outstanding qualities. To the most outstanding sophomore and the most outstanding freshman in Pershing Rifles with an average in military science of "B" or above, there is an award of a $25 government bond.

**Woman's Relief Corps Tablet.** The Illinois Department of the Woman's Relief Corps presents a tablet to the eighteen senior cadets outstanding in military excellence.

### School of Physical Education

**Delta Theta Epsilon Award.** A trophy is awarded annually by Delta Theta Epsilon, honorary physical education fraternity, to a senior in the curriculum in physical education for men. Character, scholarship, personality, and ability as a teacher are considered by the faculty committee in making the award.

## PRIZES NOT LIMITED TO THE UNIVERSITY OF ILLINOIS

### General Competitions

**Intercollegiate Conference Medal.** The Intercollegiate Conference, through its faculty representative of each conference institution, awards annually a medal to the student of

the graduating class who has attained the greatest proficiency in athletics and in scholastic work.

**Phi Kappa Phi (Sparks Memorial) Fellowship.** Six fellowships of $1,200 each, for graduate study in any American institution of recognized standing, are awarded annually by Phi Kappa Phi, national honor society, in competitions open to members of the society in any American college or university where a chapter of the society exists. The recipients are selected by a national board from candidates recommended by the local chapters. Prospective candidates should file their applications with the local secretary of the society early in the second semester.

## College of Engineering

**American Institute of Mining and Metallurgical Engineers' Student Technical Paper Writing Contest.** Competition is open to all student associates of the Institute, both undergraduate and graduate. The Chicago Section offers cash prizes of $100 and $50, and books for the best papers among colleges in this section. The best papers from local sections throughout the country are judged for national prizes.

**American Society of Mechanical Engineers Prize.** This society offers annually five prizes of $5 to $50 for the best papers prepared by senior student members of the society as judged in sectional competitions. This society also offers an annual prize of $25 to the student preparing the best paper on a selected topic in a nationally conducted competition.

**Highway Prize.** The Illinois Association of County Superintendents of Highways gives an annual prize of $25 for the best paper written by a senior in civil engineering on a subject in the highway field, such as design, construction, or maintenance. This is given with the understanding that the winning paper will be presented at the Annual Highway Conference.

**John Smeaton Award.** The Illinois Concrete Pipe Association gives an annual prize of $25 for the best paper written by a senior in the College of Engineering on the manufacture of concrete pipe.

**Tau Beta Pi Fellowship.** Six fellowships of approximately $650 each, for graduate study in any engineering college of recognized standing, are awarded annually by Tau Beta Pi, national engineering honor society, in competitions open to members of the organization in any American college or university where a chapter of Tau Beta Pi exists. The recipients are selected by a national board from candidates recommended by the local chapters. Prospective candidates should file their applications with the chairman of the board prior to March 1.

## College of Fine and Applied Arts

**American Academy in Rome Fellowships in Architecture and Landscape Architecture.** In annual competitions open to qualified undergraduates and graduates of certain American schools, the American Academy in Rome usually awards two fellowships: (1) the Fellowship in Architecture, which provides two years of residence and travel abroad for the study of classic and renaissance architecture; and (2) the Fellowship in Landscape Architecture, which provides a three-year term of study in landscape architecture at Rome. Since 1942, the Academy has offered cash prizes in lieu of foreign fellowships.

**American Society of Landscape Architects Certificate.** A certificate of merit is awarded each year to a graduating senior in each of the ten schools on the accredited list of the American Society of Landscape Architects. In nominating candidates for this award, the faculty considers scholarship, character, ability, and attainment.

**Beaux Arts Institute of Design.** Several prizes and scholarships offered annually through the Beaux Arts Institute of Design are open for competition among qualified students of certain American schools, including the University of Illinois.

**Paris Prize.** The Society of Beaux Arts Architects offers an annual award known as the Paris Prize, competition for which is open to qualified students of certain American schools, including the University of Illinois. This prize provides one year of study abroad.

**Edward L. Ryerson Traveling Fellowships.** Seniors and graduate students of the University of Illinois are eligible to compete for the Edward L. Ryerson Traveling Fellowships offered each year, one in Architecture and one in Landscape Architecture. Each fellowship grants a stipend to be used for a period of approved study abroad of not less than six months duration.

## COLLEGES AND SCHOOLS

College of Agriculture

Institute of Aviation

College of Commerce and Business Administration

College of Education

College of Engineering

College of Fine and Applied Arts

School of Journalism and Communications

College of Law

College of Liberal Arts and Sciences

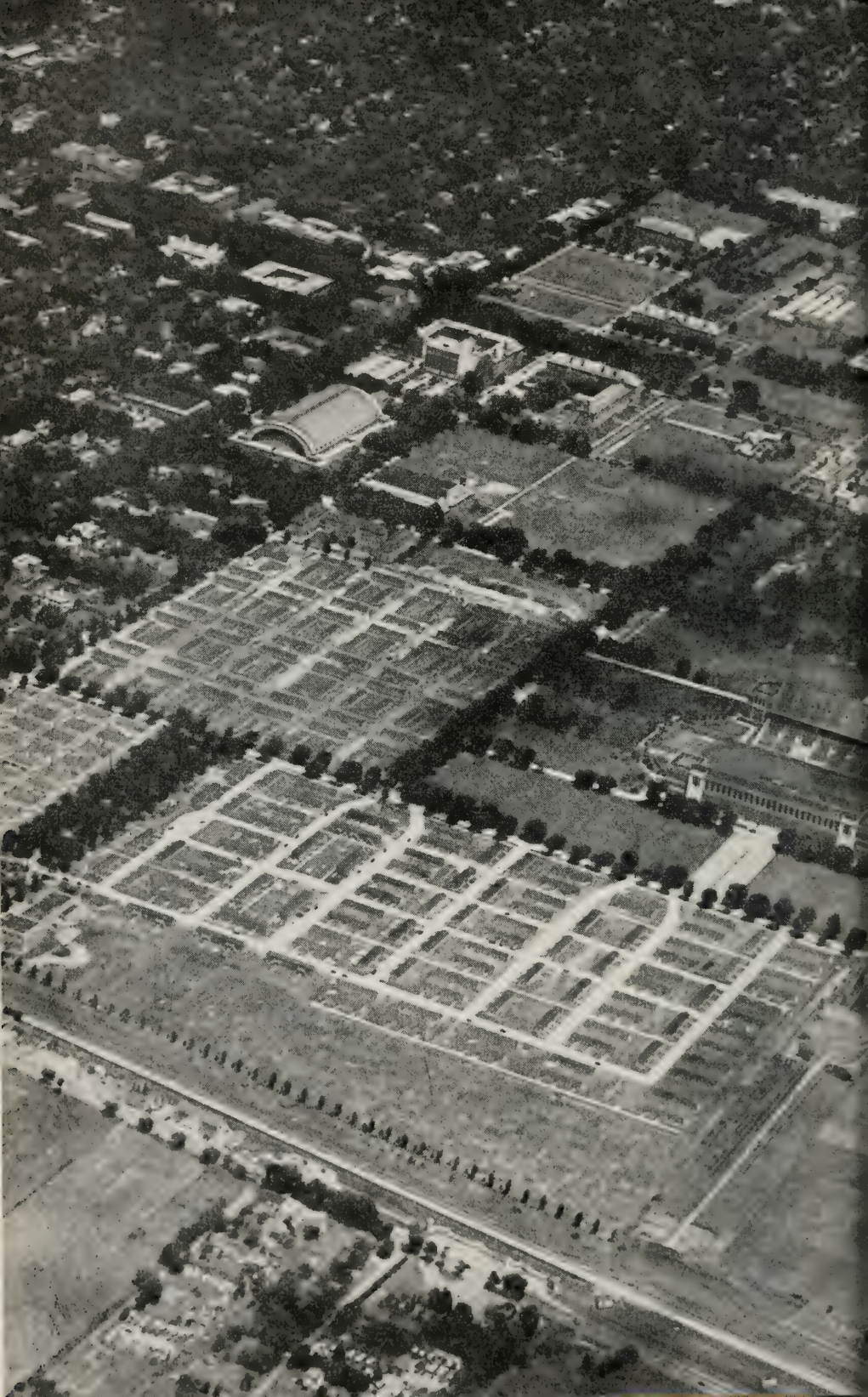
Library School

School of Physical Education

Division of Social Welfare Administration

Division of Special Services for War Veterans

College of Veterinary Medicine



College of Agriculture

Class in Dairy Cattle Judging

Vocational Agriculture Instructor Working With His Student

# College of Agriculture

The College of Agriculture prepares men and women for successful careers in agriculture and home economics. It offers many courses in these two fields, which have in common an interest in the production, processing, sale, and use of food and clothing materials, and a direct approach to higher levels of living. Illinois, located in one of the greatest agricultural regions of the world, is in an advantageous position for teaching and research in agriculture and the related industries. While many courses in this college are open to all qualified students in the University, most of the courses are designed primarily for students who desire to follow a four-year curriculum in agriculture or home economics.

There are several four-year curricula leading to the degree of Bachelor of Science, one two-year curriculum which prepares for entry into a school or college of forestry, and a pre-theological program for students interested in the rural ministry. The curriculum in agricultural science povides a flexible program for students who wish to prepare for graduate study in agricultural fields or for technical work requiring more science or mathematics, or both, than can be included in the general agriculture curriculum. It presupposes careful program planning under the supervision of a properly selected faculty adviser, especially after the freshman year. The general agriculture curriculum is broad and flexible, with sufficient electives to meet specific needs. Graduates from this curriculum engage in various types of farming, in educational and extension work, in civil or public service, in the marketing of agricultural products, in the sale and service of agricultural equipment and supplies, in agricultural credit work, and in numerous other activities related to agriculture. Graduates from the general agriculture curriculum with a major for teachers of vocational agriculture are prepared to teach in the high schools of Illinois and most other states. The curriculum in dairy technology leads to employment in the dairy manufacturing industry, or to research or teaching in this field. The floriculture curriculum prepares for employment in the production and sale of flowers and other ornamental plants. The curriculum in food technology is designed for students planning technical or administrative careers in food processing or food marketing. The curriculum in restaurant management provides, in addition to training in this field, preparation for work as purchasing agents, kitchen equipment and layout specialists, food inspectors, and for other allied occupations.

In home economics the College of Agriculture provides a four-year general curriculum leading to the degree of Bachelor of Science. Within this curriculum major programs are provided in apparel design, child and

family, foods and nutrition, general home economics, hospital dietetics, household management, institution management, retailing apparel and home furnishings, and textiles and clothing. Graduates in home economics are engaged in homemaking; in teaching; as dietitians in hospitals and other institutions; in management of cafeterias, dormitories, and the food service units in hotels, clubs, airlines, and bus lines; in retailing in the textiles, clothing, and home furnishings fields; in research in colleges and universities, government agencies, and industry; in extension services; and as nutritionists and consultants with public health and social agencies. Students preparing to teach home economics in high schools having departments of vocational home economics should enroll in the curriculum in home economics education.

The curriculum in agricultural engineering, which is administered by the College of Engineering, includes general and specialized courses offered in the College of Agriculture.

The first two years in each curriculum include the necessary scientific and cultural basis for later specialization. Each student is assisted in arranging his program by a member of the faculty under the organized advisory system of the College. Each new student in agriculture is supplied with a copy of *A Handbook for Agricultural Students and Their Advisers.* It contains instructions on choice of individual objectives, and suggestions for educational programs of study appropriate to those objectives.

The instructional program of the College of Agriculture is constantly enriched by close association with the work of the Agricultural Experiment Station and the Extension Service in Agriculture and Home Economics. Staff members and students thus have direct contact with current problems in research and practice.

### Requirements for Admission

Besides meeting the general admission requirements of the University, students entering the College of Agriculture are required to have one high school unit of algebra and one of plane geometry. It is recommended that prospective students take an additional half unit of mathematics, a unit of physics, or a unit of chemistry. A high school major in science or mathematics is desirable.

### Requirements for Graduation

Students who have satisfied the general University requirements for graduation, have maintained throughout their course a satisfactory record of scholarship and moral character, and have completed a curriculum in the College of Agriculture including the prescribed studies and sufficient electives to make a total of 130 semester hours in all curricula except in home economics are graduated with the degree of Bachelor of Science. The requirement for the degree of Bachelor of Science in Home Economics is 120 hours exclusive of required work in physical education. The requirement for the degree of Bachelor of Science in Home Economics Education is 124 hours exclusive of required work in physical education. (For the special requirements of each curriculum, see the outlines on the following pages.)

A candidate for graduation must complete all special examinations to remove failures, all proficiency examinations, and all course substitutions by the beginning of the tenth week of his final semester.

Students who have transferred from other educational institutions to the University of Illinois and are candidates for the degree of Bachelor of Science in an agricultural curriculum are required to complete in residence at least half the technical agriculture credit required for the degree. Graduates of approved colleges may secure a degree in agriculture from the University on completion of the technical and scientific requirements. This usually requires two years of residence work; a minimum of one year is required.

## Honors at Graduation

Honors awarded at graduation to superior students are designated, after the degree on the diploma, as Honors, High Honors, and Highest Honors, according to the following rules: For the degree with Honors, the student must have an average of 4.0 in all courses used for graduation; for the degree with High Honors, a student must have an average of 4.25 in all courses counted toward graduation and pass a comprehensive examination in his field of major interest; and for the degree with Highest Honors, the student must have an average of 4.5 in all courses used for graduation and give evidence of exceptional ability by passing a comprehensive examination in his field of major interest.

## Departments and Curricula

The College of Agriculture comprises nine departments which offer courses open to all qualified students in the University. These departments, their work and equipment, are described in the following paragraphs with reference to the curricula as outlined on subsequent pages.

**Agricultural Economics.** Courses in agricultural economics pertain to economic principles as applied to agriculture, farm management, land economics, agricultural marketing, agricultural credit, agricultural prices and statistics, and rural organizations. A basic course in agricultural economics is designed to give an introduction to these fields. A more advanced course deals with the external economic relationships of agriculture, while work in farm management deals with the internal economic relationships of farming based on financial and detailed cost records secured from farmers throughout Illinois. Work in land economics includes utilization, tenure, and conservation of land, while a course in farm appraisals is conducted in cooperation with other departments. Courses are available dealing with the principles and problems of agricultural marketing and cooperation, as well as with the particular problems connected with the marketing of grain, livestock, dairy products, and horticultural products. Work is offered in the field of agricultural credit, dealing with the credit needs of farmers and the means of supplying these needs. Courses in agricultural prices and statistics include work in price analysis and the application of statistical methods to agricultural data. Work in rural organization deals with the structure and functions of and participation in farmers' organizations and trends in their development. Provision is made for advanced study in all of these fields by qualified undergraduate and graduate students.

**Agricultural Engineering.** Courses in agricultural engineering cover the principles of engineering as applied to agriculture, including engineering problems of agriculture, farm shop, soil and water engineering, farm buildings and housing, farm field machinery, tractors, horticultural machinery, crop processing, food engineering, rural electrification, and farm home equipment. The department has an assortment of tractors, gas engines, and farm machinery for student use. Heating and lighting units and water systems are provided in the home equipment laboratory. Facilities for drafting room work in farm buildings are also available. Students in the various agricultural curricula take suitable courses in agricultural engineering, and students enrolled in the curriculum in general agriculture can complete a major in farm mechanization by appropriate choice of courses.

A curriculum in agricultural engineering is provided in the College of Engineering (page 113) for those students who plan to enter teaching, research, commercial or design work in this field. The first-year requirements in this curriculum are the same as in other engineering curricula. Specialization begins in the second year. Those interested in machine design choose the power and machinery option. Another option is provided in farm structures and soil and water engineering. Students in the curriculum in agricultural engineering may secure two degrees in five years, one in agriculture and one in agricultural engineering, if they will carefully schedule the required courses of study. It is essential that



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such students complete the courses in drawing, mathematics, physics, and mechanics required in agricultural engineering during their first three years at the University to be able to complete the requirements for both degrees by the end of the fifth year. Freshmen who are interested should consult the Head of the Department of Agricultural Engineering.

**Agronomy.** Instruction in both crops and soils is given in the Department of Agronomy. Under crops are included such subjects as characteristics, production, and improvement of farm crops as well as the nature and control of crop enemies such as weeds, plant diseases, and insect pests. Courses in soils deal with the origin, formation, and classification of soils and also with variation, modification, and maintenance of productivity. Facilities for instruction include laboratories, field house, greenhouse, and field plots. Advanced students have opportunity to use these facilities both in their courses and in individual investigations.

**Animal Science.** Courses in animal science cover the study of sheep, swine, poultry, and beef cattle, and their products; heavy and light horses, with their care and training; the management of herds, flocks, and studs; feeding, breeding, general sanitation, and disease control in livestock; and the chemical and physiological phases of animal nutrition. The University herds, flocks, and studs contain several hundred purebred cattle, swine, sheep, and horses, and several hundred fowl, which are available for class purposes and for feeding and breeding investigations. The Stock Judging Pavilion offers opportunity for show and judging work. The department equipment includes buildings for the housing of beef cattle, swine, sheep, horses, and poultry, and a feed storage barn with grinding mills and other feed preparation machinery. Laboratories afford facilities for undergraduate and advanced study in animal nutrition and animal genetics.

**Dairy Science.** The courses in dairy science are concerned with the breeding and feeding of dairy cattle, including genetics, nutrition, and physiology; management, sanitation, and judging of dairy cattle; and the chemical, physiological, and bacteriological phases of milk production and utilization. The equipment of this department includes laboratories for dairy bacteriology, dairy chemistry, and dairy production. A farm stocked with a herd of more than 250 head of dairy cattle of the Holstein-Friesian, Jersey, Guernsey, Brown Swiss, and Ayrshire breeds affords facilities for undergraduate and advanced study in the several phases of work listed above.

**Food Technology.** Instruction in food technology, including dairy technology, is conducted in this department. The department is responsible for all courses in food processing except those which have to do with preparation of food in the home. Students majoring in food technology are offered two undergraduate curricula, one leading to the degree of Bachelor of Science in Food Technology and the other to the degree of Bachelor of Science in Dairy Technology. Graduate study leading to the master's and doctor's degrees is available in both fields. The equipment of this department includes a commercial-type creamery with provisions for making butter, cheese, condensed milk, ice cream, powdered milk, and other milk products. Pilot plant facilities for the processing and preservation of fruits, vegetables, cereals, oilseeds, meats, and other classes of foods are available. These include modern equipment of commercial types for canning, freezing, dehydrating, cereal milling, oilseed processing, vacuum concentrating, and other operations involved in food manufacture. Laboratories for research and teaching in chemistry, microbiology, and engineering as applied to all types of food products and processes are available.

**Forestry.** The preforestry curriculum provides two years of study in subjects prerequisite to technical training in forestry. It prepares the student to enter a school of professional forestry with two years of advanced standing. Although registration is in the College of Agriculture, many of the courses of instruction are in the Colleges of Liberal Arts and Sciences and Engineering. The preforestry curriculum utilizes the laboratory, drafting, demonstration, and classroom facilities of several departments in each of these colleges as well as those of the College of Agriculture. The equipment of the Department of Forestry includes maps, charts, lantern slides, and a working library of some 3,500 books and pamphlets on forestry. Students who are interested in forestry as a profession should consult the Head of the Department of Forestry concerning registration.

**Home Economics.** The courses given in this department are planned primarily to meet the needs of students who desire a knowledge of the general principles and facts of home economics. In addition to the basic courses in home economics, opportunity is given for concentration in the following fields: apparel design, child and family, foods and nutrition,

general home economics, hospital dietetics, household management, institution management, retailing apparel and home furnishings, textiles and clothing, and teacher education. The department is housed in Bevier Hall, where there are specially equipped laboratories and lecture rooms and a cafeteria which is used as a teaching laboratory. Facilities for demonstration and practice in household management are provided in the Home Management House.

A curriculum in restaurant management, intended for both men and women, is supervised by the Department of Home Economics. In addition to courses covering the general education requirements for all students, the curriculum provides a combination of business and food-service training intended to fit the needs of students planning employment in food-service establishments.

A group of courses has been especially set up to meet the needs of students majoring in other fields who wish to take some work in home economics. There are no prerequisites for these courses.

**Horticulture.** Courses in horticulture provide instruction in five divisions (pomology, vegetable crops, floriculture, plant breeding, and plant pathology) and in subjects dealing with all these divisions, such as plant propagation, spraying, the evolution of horticultural plants, and experimental horticulture. For instruction in pomology and plant pathology, use is made of the varietal and experimental plantations maintained by the department and of the Horticulture Field Laboratory. This building is equipped with cold storage rooms, constant-temperature chambers, and a greenhouse, and with chemical, physiological, histological, and pathological laboratories. Facilities for instruction in vegetable crops include a physiological laboratory, greenhouses, and several acres of land on which garden operations are illustrated and the principal vegetable crops are grown. A laboratory furnishes opportunity for the study of methods of packing. The equipment for floriculture includes ten glasshouses, a service building, and laboratory facilities. The houses contain a selection of roses, carnations, and chrysanthemums, and of plants representing the forms used in commercial and decorative or conservatory work. The ornamental gardens furnish illustrative materials for students in floriculture and landscape architecture.

## Curriculum in Agricultural Engineering

*For the Degree of Bachelor of Science in Agricultural Engineering*

This curriculum, outlined on page 113, is administered by the College of Engineering with the cooperation of the Department of Agricultural Engineering in the College of Agriculture. Interested students should inquire at the office of the Associate Dean of the College of Engineering, 300 Civil Engineering Hall, for an outline of the plan.

Students interested in the five-year combination program for the degrees of Bachelor of Science in Agriculture and Bachelor of Science in Agricultural Engineering should consult the Head of the Department of Agricultural Engineering, 206 Agricultural Engineering Building. The curriculum in agricultural engineering may be combined with either the curriculum in agricultural science or the curriculum in general agriculture.

## Curriculum in Agricultural Science

*For the Degree of Bachelor of Science in Agriculture*

This curriculum is especially designed for students who plan to do graduate study in agricultural fields or for those who wish to engage in technical work requiring more science or mathematics than is included in the general agriculture curriculum. A student will be permitted to enter the curriculum and to continue in it only if he has a grade-point average of 3.5 or higher. A minimum of 130 hours of credit is required for graduation.

The curriculum lends itself to individualized programs of study. It presupposes careful individual planning under the supervision of a faculty adviser qualified in the student's special field of interest. For assistance in selecting a program plan and for assignment to an adviser, call at the office of the Associate Dean, 104 Mumford Hall.

Two options are provided in this curriculum:

Option 1. For students desiring preparation for graduate study or technical work in animal, plant, or soil science.

Option 2. For students desiring preparation for graduate study or technical work in the fields included in agricultural economics and rural sociology.

### Summary

| | OPTION 1 HOURS | OPTION 2 HOURS |
|---|---|---|
| General University Requirements (hygiene, military training, physical education, and rhetoric) | 16 | 16 |
| Group I: College of Agriculture Courses | 35 | 35 |
| Group II: Humanities (art, music, language, literature, philosophy) | 6 | 6 |
| Group III: Social Science (economics, geography, history, political science, psychology, sociology) | 6 | 16[2] |
| Group IV: Biological Science (bacteriology, botany, entomology, physiology, zoology) | 10[1] | 6 |
| Group V: Physical Science (chemistry, geology, mathematics, physics) | 10[1] | 16 |
| Electives (unrestricted) | 22 | 35 |
| *Total Required for Graduation* | 130 | 130 |

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Math. 111—Algebra, or Math 112—College Algebra[3] | 5 or 3 | Math. 114—Plane Trigonometry[3] | 2 |
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 105—Inorganic Chemistry and Qualitative Analysis, or Chem. 106—Inorganic Chemistry | 5 |
| Hygiene 101—Health Lectures | 2 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Electives | 3 to 6 |
| Electives | 0 to 5 | | |
| *Total* | 15 to 18 | *Total* | 15 to 18 |

### Second, Third, and Fourth Years

The programs for the second, third, and fourth years should be planned in consultation with the faculty adviser.

## General Curriculum in Agriculture

*For the Degree of Bachelor of Science in Agriculture*

This curriculum is designed for students in agricultural fields not requiring an intensive science foundation. The fields may include agricultural marketing, animal and poultry science, dairy production, farm crops, farm management, farm mechanization, pomology, rural group leadership, soil conservation, vegetable production, vocational agriculture, and others as agreed upon by the faculty. A minimum of 130 hours of credit is required for graduation.

[1] All students in Option 1 must complete a total of forty-five hours in Groups IV and V combined, with a minimum of ten hours in each.

[2] Students in Option 2 must include at least eight hours in economics.

[3] The student planning to take advanced work in chemistry may take Math. 117 or 127 instead of the indicated mathematics course.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Bot. 100—General Botany | 4 | Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures | 2 | Zool. 104—General Zoology | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Two Courses from Group I | 6 | One Course from Group I | 3 or 4 |
| *Total* | 17 | *Total* | 15 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Geol. 105—Agricultural Geology | 3 | Agron. 201—Soils | 5 |
| Chem. 132—Elementary Organic Chemistry | 3 | Econ. 108—Elements of Economics | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Three Courses from Group I | 9 | Two Courses from Group I | 6 |
| *Total* | 17 | *Total* | 16 |

### Third and Fourth Years

During the third and fourth years the student must elect sufficient courses in agriculture to make a total of fifty hours in agricultural courses including those prescribed. The student must also earn a minimum of twelve semester hours credit in humanities and social studies, and sufficient unrestricted electives to bring his total credits up to the 130 hours required for graduation.

GROUP I: Courses in agriculture required of all students in the general agriculture curriculum. All students should complete this list before the third year or as soon thereafter as possible.

| | HOURS |
|---|---|
| Agr. Econ. 100—Introductory Agricultural Economics[1] | 3 |
| Agr. Eng. 101—Introduction to Agricultural Engineering | 3 |
| Agron. 121—Crop Production | 4 |
| An. Sci. 101—Introduction to Animal Science | 3 |
| An. Sci. 102—Principles of Feeding | 3 |
| D.S. 100—Introduction to Dairy Production | 3 |
| Forestry 101—General Forestry, or Forestry 102—Farm Forestry, or Horticulture Elective | 3 or 2 |
| Hort. 100—Introductory Horticulture | 3 |
| *Total* | 24 or 25 |

GROUP II: A minimum of twelve hours in humanities and social studies to be selected from art, economics, English, foreign language, geography, history, journalism, landscape architecture, law, music, philosophy, political science, psychology, sociology, or speech.

## General Curriculum in Agriculture

### (With Major for Teachers of Vocational Agriculture)

*For the Degree of Bachelor of Science in Agriculture*

The purpose of this curriculum is to train young men to teach agriculture in high schools having departments of vocational agriculture. In addition to the training outlined in this curriculum, the present Illinois State Plan for Teachers of Vocational Agriculture

[1] Students entering as juniors or seniors should substitute Agr. Econ. 120 or 130 for Agr. Econ. 100.

calls for a minimum of two years of practical experience on the farm after reaching the age of sixteen.

A minimum of 130 hours of credit, counting the first two years in military training and physical education, as outlined below, is required for graduation. While students are advised to take courses in the order indicated, they may, with the approval of their advisers, take courses at another time.

Students who complete this curriculum will possess a teaching minor in the biological sciences and are also qualified to teach general science.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Agr. Ed. 276) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Agr. Ed. 276) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Bot. 100—General Botany | 4 | Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Zool. 104—General Zoology | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Two Courses from Group I | 6 | One Course from Group I | 3 or 4 |
| *Total* | 17 | *Total* | 15 to 18 |

## Second Year

| | | | |
|---|---|---|---|
| Agr. Eng. 111—Farm Structures and Soil and Water Conservation, or Agr. Eng. 112—Tractors and Field Machinery | 3 | Agr. Eng. 112—Tractors and Field Machinery, or Agr. Eng. 111—Farm Structures and Soil and Water Conservation | 3 |
| Ed. 101—The Nature of the Teaching Profession | 2 | Chem. 132—Elementary Organic Chemistry | 3 |
| Geol. 105—Agricultural Geology | 3 | Econ. 108—Elements of Economics | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Two Courses from Group I | 6 | Two Courses from Group I | 6 |
| *Total* | 16 | *Total* | 17 |

## Third Year

| | | | |
|---|---|---|---|
| Agron. 201—Soils | 5 | Agr. Econ. 120—Farm Management | 3 |
| Psych. 100—Introduction to Psychology | 4 | Hist. 152—History of the United States, 1865-1951. | 3 |
| Speech 101—Principles of Effective Speaking | 3 | Ed. 201—Foundations of American Education | 2 |
| Agricultural Electives | 3 to 6 | Ed. 240—Principles of Secondary Education | 2 |
| | | Agricultural Electives | 6 |
| *Total* | 15 to 18 | *Total* | 16 |

### Fourth Year

(Semesters are interchangeable. Courses taken with practice teaching will be offered during a ten-week period.)

| | | | |
|---|---|---|---|
| Agr. Ed. 276—Practice in Agricultural Education | 5 | Pol. Sci. 150—American Government | 3 |
| Agr. Ed. 277—Programs and Procedures in Agricultural Education | 5 | Electives (including two hours of humanities)[2] | 11 to 17 |
| Agr. Eng. 201—Farm Shop Work, D.S. 204—Dairy Production,[1] or other Agricultural Elective | 2 to 3 | | |
| Ed. 211—Educational Psychology | 3 | | |
| *Total* | 15 to 16 | *Total* | 14 to 20 |

GROUP I: Courses in agriculture required of all students in the general agriculture curriculum:

| | HOURS |
|---|---|
| Agr. Econ. 100—Introductory Agricultural Economics | 3 |
| Agron. 121—Crop Production | 4 |
| An. Sci. 101—Introduction to Animal Science | 3 |
| An. Sci. 102—Principles of Feeding | 3 |
| D.S. 100—Introduction to Dairy Production | 3 |
| Hort. 100—Introductory Horticulture | 3 |
| Forestry 101—General Forestry, or Forestry 102—Farm Forestry, or Horticulture Elective | 3 or 2 |
| *Total* | 22 or 21 |

### Fifth Year

*For the Degree of Master of Science in Agricultural Education*

| FIRST SEMESTER | UNITS | SECOND SEMESTER | UNITS |
|---|---|---|---|
| Agricultural Courses with Graduate Credit | 2 | Agricultural Courses with Graduate Credit | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| Electives | 1 | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| | | Electives | 1 |
| *Total* | 4 | *Total* | 4 |

## Program in Agriculture and Law

A plan has been agreed upon between the College of Agriculture and the College of Law by which a student may earn the degree of Bachelor of Science in Agriculture and the degree of Bachelor of Laws in six years. In this case the student must plan carefully so as to include all prescribed courses in agriculture during the first three years, after which he transfers to the College of Law for the fourth year. He can thus receive the agricultural degree at the end of the fourth year and the law degree at the end of the sixth year. This program can best be fitted into the agricultural science curriculum under Option 2. Students who are interested may obtain an outline of this plan from the Office of the Associate Dean, 104 Mumford Hall.

[1] D.S. 204 is offered in the second semester only.
[2] A total of six hours of humanities is necessary for certification.

## Curriculum in Dairy Technology

*For the Degree of Bachelor of Science in Dairy Technology*

The following program is designed for students interested in the technical or business aspects of dairy manufacturing. A minimum of 130 hours of credit is required for graduation.

All students specializing in dairy technology are expected to take an inspection trip either in the junior or senior year. This trip costs about $35.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Math. 111—Algebra, or Math. 112—College Algebra | 5 or 3 | Math. 114—Plane Trigonometry | 2 |
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Hygiene 101—Health Lectures | 2 | D.S. 100—Introduction to Dairy Production | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 13 to 17 | *Total* | 15 |

### Second Year

| | | | |
|---|---|---|---|
| Bact. 104 and 105—Introductory Bacteriology | 5 | D.S. 150—General Dairy Bacteriology | 2 |
| D.T. 101—Introduction to Dairy Technology | 3 | D.S. 151—General Dairy Bacteriology | 3 |
| D.T. 103—Dairy Products Judging | 1 | D.T. 104—Dairy Products Judging | 1 |
| Econ. 108—Elements of Economics | 3 | Chem. 122—Elementary Quantitative Analysis | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 3 | Electives | 3 |
| *Total* | 17 | *Total* | 16 |

### Third Year

| | | | |
|---|---|---|---|
| D.T. 303—Cheese Manufacture | 3 | D.T. 302—Creamery Butter Manufacture | 3 |
| Chem. 133—Elementary Organic Chemistry | 5 | D.T. 304—Market Milk | 3 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 | Accy. 201—Fundamentals of Accounting | 3 |
| Electives | 3 to 5 | Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| | | Electives | 3 |
| *Total* | 16 to 18 | *Total* | 17 |

### Fourth Year

| | | | |
|---|---|---|---|
| D.T. 301—Ice Cream Manufacture | 3 | D.T. 306—Condensed Milk and Milk Powder Manufacture | 3 |
| Electives | 15 | Electives | 15 |
| *Total* | 18 | *Total* | 18 |

Group I: A minimum of fifteen hours in courses offered by the College of Agriculture is required in addition to those agricultural courses prescribed. Electives in this group are to be chosen from advanced courses with the guidance of an adviser.

GROUP II: A minimum of twelve hours to be selected from art, economics, English, foreign language, geography, history, journalism, landscape architecture, law, music, philosophy, political science, psychology, sociology, or speech.

## Curriculum in Floriculture

*For the Degree of Bachelor of Science in Floriculture*

The following program is designed for students preparing to grow and sell flowers and other ornamental plants or to do teaching and research in this field. In addition to prescribed courses, a minimum of four hours is required in English, foreign language, geography, history, landscape architecture, philosophy, political science, psychology, rhetoric, sociology, or speech. A minimum of 130 hours of credit is required for graduation.

Students registered in floriculture are required to make at least one inspection trip before graduation. The trip costs about $25.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 132—Elementary Organic Chemistry | 3 |
| Hort. 121—Plant Propagation | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Entom. 101 and 102—Destructive and Useful Insects | 5 |
| Bot. 100—General Botany | 4 | Physical Education | 1 |
| Hygiene 101—Health Lectures | 2 | Military (men) | 1 |
| Physical Education | 1 | Electives | 3 to 5 |
| Military (men) | 1 | | |
| *Total* | 17 to 19 | *Total* | 16 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Accy. 101—Principles of Accounting | 3 | Accy. 105—Accounting Procedure | 3 |
| Bot. 130—Plant Physiology | 5 | Agron. 201—Soils | 5 |
| Econ. 108—Elements of Economics | 3 | Bot. 160—Introductory Systematic Botany | 3 |
| Geol. 105—Agricultural Geology | 3 | Hort. 122—Greenhouse Management | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 0 to 2 | Electives | 0 to 2 |
| *Total* | 16 to 18 | *Total* | 16 to 18 |

### Third Year

| | | | |
|---|---|---|---|
| Bot. 317—Plant Pathology | 3 | Hort. 224—Commercial Floricultural Crops | 3 |
| Hort. 223—Commercial Floricultural Crops | 3 | Hort. 230—Garden Flowers | 3 |
| Hort. 321—Floricultural Physiology | 3 | Hort. 322—Plant Nutrition | 3 |
| L.A. 251—Trees and Shrubs | 3 | L.A. 252—Trees and Shrubs | 3 |
| Electives | 3 to 6 | Electives | 3 to 6 |
| *Total* | 15 to 18 | *Total* | 15 to 18 |

### Fourth Year

| | | | |
|---|---|---|---|
| Hort. 231—Floral Decoration | 3 | Hort. 226—Tender Bedding Plants | 3 |
| Electives | 12 to 15 | Hort. 232—Floral Decorations | 3 |
| | | L.A. 164—Appreciation of Landscape Architecture | 3 |
| | | Electives | 6 to 9 |
| *Total* | 15 to 18 | *Total* | 15 to 18 |

### Suggested Electives

(Second, Third, or Fourth Year)

| | HOURS |
|---|---|
| Agron. 323—Improvement of Farm Crops by Breeding | 3 |
| Bot. 322—Genetics | 4 |
| Bus. Law 261—Summary of Business Law | 3 |
| Entom. 319—Chemical Control of Insects | 4 |
| Hort. 204—Spraying | 3 |
| Hort. 345—Growth and Development of Vegetable Crops | 4 |
| Hort. 382—Improvement of Horticultural Crops by Breeding | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| Mktg. 271—Salesmanship | 2 |
| Mktg. 281—Introduction to Advertising | 3 |
| Rhet. 151—Business Letter Writing | 2 |

## Curriculum in Food Technology

*For the Degree of Bachelor of Science in Food Technology*

This program is designed for students who wish to prepare for employment as food production, quality control, research, or technical sales workers in governmental agencies, educational institutions, and in such food processing industries as canning, freezing, fermenting, milling and baking, vegetable oil processing, and confection manufacturing. A total of 130 hours of credit, not counting the first two years of military and physical education, is required for graduation.

Students are strongly urged to engage in at least one summer of employment in selected food processing industries and are required to go on a senior inspection trip of three days' duration. Estimated cost of inspection trip is $35.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Math. 117—Combined Freshman Mathematics[1] | 5 | Math. 127—Combined Freshman Mathematics[1] | 4 |
| D.G.S. 111—Verbal Communication | 4 | D.G.S. 112—Verbal Communication | 4 |
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Hygiene 101—Health Lectures | 2 | Bot. 100—General Botany | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 14 to 16 | *Total* | 17 |

### Second Year

| | | | |
|---|---|---|---|
| Math. 137—Calculus[2] | 3 | Math. 147—Calculus[2] | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Chem. 122—Elementary Quantitative Analysis | 5 | Chem. 133—Elementary Organic Chemistry | 5 |
| Zool. 104—General Zoology | 4 | Electives | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 | *Total* | 16 |

[1] Students lacking the necessary entrance requirements for Math. 117 will take the sequence of Math. 111, Algebra, Math. 114, Plane Trigonometry, and Math. 122, Analytic Geometry.

[2] Students who follow the algebra, trigonometry, analytic geometry sequence will take Math. 132 and 142, Calculus.

### Third Year

| | | | |
|---|---|---|---|
| F.T. 201—Elements of Food Technology | 3 | F.T. 202—Elements of Food Technology | 3 |
| F.T. 269—Raw Materials for Processing | 3 | F.T. 270—Raw Materials for Processing | 3 |
| Bact. 104 and 105—Introductory Bacteriology | 5 | Bact. 308—Food and Applied Bacteriology | 5 |
| Chem. 247—Elementary Physical Chemistry[1] | 4 | Chem. 249—Chemistry of Colloids[1] | 3 |
| Electives | 2 | Electives | 3 |
| *Total* | 17 | *Total* | 17 |

### Fourth Year

| | | | |
|---|---|---|---|
| Chem. 350—Biochemistry | 5 | Chem. 329—Food Analysis | 5 |
| F.T. 301—Food Processing | 4 | F.T. 206—Inspection Trip | 0 |
| F.T. 363—Unit Operations in Food Technology | 3 | F.T. 302—Food Processing | 4 |
| Electives | 4 | F.T. 332—Principles of Sanitation in the Processing and Handling of Foods | 4 |
| | | Electives | 3 |
| *Total* | 16 | *Total* | 16 |

### Electives

A minimum of fifteen hours shall be selected from art, economics, English, foreign language, geography, history, journalism, landscape architecture, law, music, philosophy, political science, psychology, sociology, and speech. Social science courses offered by the Division of General Studies may be used to satisfy this requirement. Students contemplating continuation of their studies for an advanced degree are advised to elect one of the foreign languages.

## Curriculum in Restaurant Management

*For the Degree of Bachelor of Science in Restaurant Management*

This four-year curriculum is provided for students, both men and women, in the College of Agriculture and home economics who desire training in restaurant management. In addition to preparation for this field, students may, by use of appropriate electives, prepare for work as purchasing agents, kitchen equipment and layout specialists, food inspectors, and for other allied occupations. A total of 130 hours of credit is required for graduation.

Two summers (a minimum of eight weeks each), or equivalent, of practical restaurant experience are required and should be completed before registering in Home Economics 355. This experience normally should come at the end of the second and third years.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Physiol. 103—Introduction to Human Physiology | 4 | Psych. 103—Human Behavior | 4 |
| Chem. 101 or 102—General Chemistry, or Electives[2] | 5 or 3 | Speech 101—Principles of Effective Speaking | 3 |
| Hygiene 101—Health Lectures | 2 | Chem. 101 or 102—General Chemistry, or Electives[2] | 5 or 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 14 to 16 | *Total* | 15 to 17 |

[1] Students adequately qualified may substitute Chem. 240 and 342, Elementary Physical Chemistry, for Chem. 247 and 249.

[2] Students taking Chem. 101 or 102 the first semester may take electives the second semester; those taking electives the first semester must take Chem. 101 or 102 the second semester.

### Second Year

| | | | |
|---|---|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 | Bact. 104 and 105—Introductory Bacteriology | 5 |
| Sociol. 100—Principles of Sociology | 3 | Econ. 108—Elements of Economics | 3 |
| English Literature | 3 | English Literature | 3 |
| Home Econ. 130—Introduction to Foods and Nutrition | 2 | Rhet. 151—Business Letter Writing | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 2 to 4 | Electives | 0 to 3 |
| *Total* | 15 to 17 | *Total* | 15 to 18 |

### Third Year

| | | | |
|---|---|---|---|
| Bus. Law 261—Summary of Business Law | 3 | Mktg. 101—Principles of Marketing | 3 |
| Econ. 240—Labor Problems | 3 | Econ. 248—Personnel Administration | 3 |
| Home Econ. 131—Foods | 3 | Home Econ. 220—Dietetics | 3 |
| An. Sci. 104—Selection and Use of Meat | 2 | Home Econ. 240—Quantity Cookery | 5 |
| Accy. 101—Principles of Accounting, or Accy. 201—Fundamentals of Accounting[1] | 3 | Accy. 105—Accounting Procedure,[1] or Electives | 3 |
| Electives | 2 or 3 | | |
| *Total* | 16 or 17 | *Total* | 17 |

### Fourth Year

| | | | |
|---|---|---|---|
| Home Econ. 345—Institution Management | 3 | Home Econ. 253—Restaurant Interior | 3 |
| Home Econ. 350—Institution Dietaries and Administration | 4 | Home Econ. 355—Advanced Quantity Cookery and Catering | 3 |
| Accy. 265—Hotel Accounting | 3 | Mgmt. 204—Industrial Purchasing | 3 |
| Electives | 6 to 8 | Electives | 6 to 9 |
| *Total* | 16 to 18 | *Total* | 15 to 18 |

## Preforestry Program

The object of the two-year preforestry curriculum is to prepare young men to enter a school of professional forestry with two years of advanced standing. The preforestry curriculum provides a course of study similar to that given during the first two years at a school of forestry. Completion of the preforestry curriculum requires a minimum of sixty-one hours of work in addition to the University requirements in military training and physical education. Many forestry schools have adopted high scholarship requirements and will not accept students who do not maintain high grades. Some of them will not accept out-of-state students whose averages in their preforestry work are below 4.0. A student who wishes to follow this curriculum should declare his intention as soon as possible and ask to be assigned to a faculty adviser in the Department of Forestry. The faculty adviser should be consulted about the choice of electives best suited to admission to the particular school of forestry which the individual expects to enter.

[1] Students who elect Accy. 101 must also take Accy. 105.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Chem. 101 or 102—General Chemistry | 5 or 3 |
| Forestry 101—General Forestry | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Math. 111—Algebra, or Math. 112—College Algebra | 5 or 3 | Math. 114—Plane Trigonometry | 2 |
| Bot. 100—General Botany | 4 | G.E.D. 101—Elements of Drawing | 4 |
| Hygiene 101—Health Lectures | 2 | Zool. 104—General Zoology | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 to 19 | *Total* | 18 to 20 |

### Second Year

| | | | |
|---|---|---|---|
| C.E. 115—General Surveying | 3 | Agron. 201—Soils | 5 |
| Econ. 108—Elements of Economics | 3 | Physical Education | 1 |
| Geol. 105—Agricultural Geology | 3 | Military (men) | 1 |
| Physical Education | 1 | Electives | 11 |
| Military (men) | 1 | | |
| Electives | 5 to 7 | | |
| *Total* | 16 to 18 | *Total* | 18 |

### Electives

| | HOURS |
|---|---|
| Bot. 130—Plant Physiology | 5 |
| Bot. 160—Introductory Systematic Botany | 3 |
| Chem. 132—Elementary Organic Chemistry | 3 |
| Geog. 111—Introduction to Meteorology | 3 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Pol. Sci. 150—American Government | 3 |
| Speech 101—Principles of Effective Speaking | 3 |

## Curriculum in Home Economics

*For the Degree of Bachelor of Science in Home Economics*

This four-year curriculum is provided for students in the College of Agriculture who desire general or professional training in home economics. The 120 hours required for graduation include prescribed courses of which at least twenty-nine hours must be in home economics courses selected from Groups I, II, and III (see page 64).

The first two years of this curriculum, shown in detail, provide a foundation for the various fields of concentration and allow some variation according to the purposes of individual students. The third and fourth years are largely determined by the field of concentration selected; the nine options are described on page 64. Students who hold scholarships in home economics must take at least four hours each semester in home economics or in courses prerequisite thereto. At least five hours of advanced courses in one of the fields of concentration must be taken in residence at the University by any student transferring from another institution.

A student may also qualify for a baccalaureate degree in home economics in the College of Education (page 94) or in the College of Liberal Arts and Sciences (page 176).

## Prescribed Courses

| | HOURS |
|---|---|
| Art 185[1] | 2 |
| Bact. 104[2] | 5 |
| Chem. 101 or 102[2] and 132 or 133 | 6 to 10 |
| Econ. 108 | 3 |
| English Literature | 6 |
| Home Economics (Group I, II, and III) | 29 |
| Hygiene 101 | 2 |
| Physical Education (four semesters) | 0 |
| Physiol. 103[2] | 4 |
| Psych. 100 or 103 | 4 |
| Rhet. 101 and 102 | 6 |
| Social Sciences[3] | 6 |
| Sociol. 100 | 3 |
| *Total, Prescribed* | 76 to 80 |
| *Open Electives* | 44 to 40 |
| *Total Required for Graduation* | 120 |

Group I: The following courses totaling nine hours are required of all students in the curriculum: Home Econ. 130, 170, 180, and 201.

Group II: A minimum of eight hours chosen from the following courses is required: Home Econ. 131, 161, 162, 182, 185, 186, 202, 272. Home Econ. 232 is also a Group II course for Options 5 and 7. Students concentrating in Options 2 or 6 must select twelve hours from this group.

Group III: A minimum of twelve hours of advanced work in the student's field of concentration must be selected from the following options:

**1. Apparel Design.** Home Econ. 285, 286, 386, 395; Accy. 201; Art 115, 121, 122, 125, 126, 223, 224; Econ. 378; Rhet. 151; and Speech 101 are required.

**2. The Child and the Family.** Six hours selected from Home Econ. 210, 228, 301, 305; and six hours selected from other advanced courses in home economics or from courses in anthropology, education, psychology, social welfare administration, and sociology.

**3. Foods and Nutrition.** Twelve hours selected from Home Econ. 220, 232, 291, 292, 320, 322, 324, 328, 329, 330, 331. The following courses are also required: Chem. 105, 122, 133 (instead of 132), 350.

**4. General Home Economics.** Twelve hours selected from any advanced home economics courses, except Home Econ. 272.

**5. Hospital Dietetics.** Home Econ. 220, 240, 320, 345, 350; Chem. 105, 133 (instead of 132), 350; and Ed. 211 are required.

**6. Household Management.** Six hours selected from Home Econ. 210, 232, 273, 291, 292, 361, 378, 379; and six hours selected from other advanced courses in home economics or from courses in economics.

**7. Institution Management.** Home Econ. 220, 240, 330, 345, 350; Accy. 101 and 105, or 201; Econ. 248; and Ed. 211 are required. In order to meet the American Dietetic Association training course requirements, the following courses must be included: Chem. 105, 133, 350.

**8. Retailing Apparel and Home Furnishings.** Eleven hours selected from Home Econ. 285, 286, 380, 388 or 389, 395. The following courses are also required: Accy. 201; Art 115, 185, and 186, or Art 121 and 122; Econ. 378; Mktg. 101, 211, 271, 281, 315; Rhet. 151; Speech 101.

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[1] Each student following Option 1 or 8 must take the art courses prescribed in these options.

[2] Students in Options 1 and 8 need not take the prescribed bacteriology and physiology courses but must take Chem. 101 or 102 and an additional five to seven hours chosen from courses in bacteriology, botany, geology, or physiology; they need not take Chem. 132 or 133.

[3] Only students concentrating in Options 2, 4, 6, or 9 must take at least six hours in economics, history, philosophy, political science, psychology, or sociology, in addition to Econ. 108, Psych. 100 or 103, and Sociol. 100.

**9. Textiles and Clothing.** Twelve hours selected from Home Econ. 232, 285, 286, 291, 292, 380, 386, 388, 389, 395. Art 186 is also required.

For those interested in home economics and journalism, a sequence of journalism courses may be taken in addition to any of the above options. The following courses are required: Journ. 211, 281, 382; twelve additional hours to be selected from Journ. 204, 212, 223, 227, 263, 321, 323, 328, 382, 386, and Mktg. 101.

Students preparing to teach home economics in secondary schools should follow the curriculum in home economics education (see page 66).

## Suggested Sequence of Prescribed Courses

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 185—Design[1] | 2 | Chem. 132—Elementary Organic Chemistry[2] | 3 |
| Chem. 101 or 102—General Chemistry | 5 or 3 | Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures | 2 |
| Home Econ. 170—Introduction to Home Economics | 1 | Rhet. 102—Rhetoric and Composition | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 | Physical Education | 1 |
| Hygiene 101—Health Lectures, or Home Econ. 130—Introduction to Foods and Nutrition | 2 | Electives | 5 to 7 |
| Rhet. 101—Rhetoric and Composition | 3 | | |
| Physical Education | 1 | | |
| *Total* | 15 to 17 | *Total* | 16 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Physiol. 103—Introduction to Human Physiology[3] | 4 | Bact. 104—Elementary Bacteriology[3] | 5 |
| Psych. 100—Introduction to Psychology, or Psych. 103—Human Behavior | 4 | Sociol. 100—Principles of Sociology | 3 |
| English Literature | 3 or 4 | English Literature | 2 or 3 |
| Econ. 108—Elements of Economics | 3 | Courses from Group II[4] | 6 or 4 |
| Physical Education | 1 | Physical Education | 1 |
| Electives | 0 or 2 | | |
| *Total* | 16 or 17 | *Total* | 15 to 18 |

### Third and Fourth Years

In the third and fourth years each student will complete the prescribed courses in the chosen area of concentration and will elect courses from Groups II and III to complete the requirements for advanced work.

Those who choose Option 3 should take Chem. 122 and Home Econ. 232 in the first semester of their third year.

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[1] Each student following Options 1 or 8 must take the art courses prescribed in these options.

[2] Each student concentrating in Options 3 or 5 must take Chem. 105 the second semester and delay Chem. 133 until the second year.

[3] Students in Options 1 and 8 need not take the prescribed bacteriology and physiology courses but must take Chem. 101 or 102 and an additional five to seven hours chosen from courses in bacteriology, botany, geology, or physiology; they need not take Chem. 132 or 133.

[4] Students preparing for vocations in foods, hospital dietetics, household management, and teaching should include Home Econ. 131 in the second semester of the second year.

## Curriculum in Vocational Home Economics Education

*For the Degree of Bachelor of Science in Home Economics Education*

The purpose of this curriculum is to prepare young women to teach home economics in junior high schools, senior high schools, and junior colleges. Secondary school courses taught include composite courses in general homemaking, and courses in foods and nutrition, clothing and textiles, home and family living, home management and housing.

A minimum of 124 hours of credit, not counting the first two years of work in physical education, is required. The courses below total more than 124 hours but represent a typical load of sixteen to eighteen hours each semester. Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours.

The arrangement of courses below is recommended. With the approval of their advisers, students may take courses at another time.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 185—Design | 2 | Art 186—Design | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 | Chem. 101 or 102—General Chemistry | 5 or 3 |
| Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 | D.G.S. 112—Verbal Communication[1] | 4 |
| Home Econ. 170—Introduction to Home Economics | 1 | Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| Home Econ. 182—Clothing Laboratory | 2 | Psych. 103—Human Behavior | 4 |
| Physiol. 103—Introduction to Human Physiology | 4 | Physical Education | 1 |
| Physical Education | 1 | | |
| *Total* | 16 | *Total* | 16 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 | Econ. 108—Elements of Economics | 3 |
| Ed. 101—The Nature of the Teaching Profession | 2 | Home Econ. 131—Foods | 3 |
| Hist. 152—History of the United States, 1865-1951 | 3 | Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 161—Family Housing | 3 | Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 185—Clothing | 2 | Home Econ. 186—Costume Design | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Electives[2] | 3 | Electives[2] | 2 or 3 |
| *Total* | 17 | *Total* | 17 or 18 |

[1] Rhet. 101, 102, and Speech 101 may be taken instead of D.G.S. 111 and 112.

[2] Courses in literature and contemporary social problems are recommended as electives.

## Third Year

| | |
|---|---|
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 220—Dietetics | 3 |
| Home Econ. 232—Food Economics and Meal Management | 3 |
| Pol. Sci. 150—American Government | 3 |
| Electives | 4 or 5 |
| *Total* | 16 or 17 |

| | |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Home Econ. 202—Laboratory in Child Development | 2 |
| Home Econ. 228—Hygiene and Home Care of the Sick | 1 |
| Home Econ. 272—Organization and Management of the Home | 3 |
| Home Econ. 286—Clothing | 3 |
| Electives | 3 or 4 |
| *Total* | 16 or 17 |

## Fourth Year

(Semesters are interchangeable)

| | |
|---|---|
| Bact. 104—Introductory Bacteriology | 3 |
| Home Econ. 210—Family Relationships | 3 |
| Home Econ. 273—Home Management | 3 |
| Electives | 7 or 8 |
| *Total* | 16 or 17 |

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Home Econ. 277—The Teaching of Home Economics | 3 |
| Electives[1] | 2 or 3 |
| *Total* | 16 or 17 |

## Fifth Year

*For the Degree of Master of Science in Home Economics Education*

| I. Required Professional Courses: | UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 453—Problems in Home Economics Education | 1 |
| Ed. 456—Curriculum Problems and Trends in Secondary Education, or Home Econ. 377—Home Economics Extension | 1 or ½ |
| *Total* | 3½ or 4 |

II. A total of 2 or 2½ units chosen from the following home economics courses:

| | |
|---|---|
| Home Management: | |
| Home Econ. 361—Farm Home Planning in Relation to Function | ½ |
| Home Econ. 378, 379—Problems in Home Management | ½ to 1 |
| Foods and Nutrition: | |
| Home Econ. 320—Diet in Disease | ½ |
| Home Econ. 322—Physical Growth and Nutrition | ½ |
| Home Econ. 330—Experimental Foods | ½ |
| Home Econ. 331—Problems in Foods | ½ |
| Textiles and Clothing: | |
| Home Econ. 380—Textiles | ½ |

[1] This elective must be selected to allow for six weeks off-campus teaching. Suggested are: Home Econ. 378, 379, 388, 389.

| | |
|---|---|
| Home Econ. 386—Clothing Design and Construction | 1 |
| Home Econ. 388, 389—Problems in Textiles and Clothing | ½ to 1 |
| Home Econ. 395—Fashion Analysis | ½ |
| Child Development and Family Relationships: | |
| Home Econ. 301—Advanced Problems in Home Guidance of Children | ½ |
| Home Econ. 410—Problems in Family Living | 1 |
| Home Econ. 481 and/or 482—Seminar in Family Relationships and/or Child Development | 1 |
| III. Electives | 2 |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN HOME ECONOMICS

| | HOURS |
|---|---|
| Home Econ. 120—Elementary Nutrition | 2 |
| Home Econ. 125—Introduction to Foods | 3 |
| Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 182—Clothing Laboratory | 2 |
| Home Econ. 185—Clothing | 2 |
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 271—Home Management | 2 |
| *Total* | 20 |

Institute of Aviation

Airport Runways

SNJ Link. Research Equipment in the Use of a Synthetic Training Aid

# Institute of Aviation

The Institute of Aviation is the administrative agency responsible for the promotion and correlation of the educational and research activities related to aviation in all parts of the University. Its cooperative relationships extend into all departments, and its administrative direction is in the hands of a director who has the advice and assistance of an executive committee.

The Institute has a two-year aircraft maintenance curriculum on the college level which is designed not only to prepare students for the Civil Aeronautics Administration Aircraft and Aircraft Engine Mechanic ratings but also to give them a well-rounded education in related subjects.

Many of the various colleges and schools of the University are giving courses with which the Institute of Aviation cooperates. Examples of these are the professional pilot curriculum in the Division of General Studies, the aeronautical engineering curriculum in the College of Engineering, and the airline-airport management curriculum in the College of Commerce and Business Administration.

From time to time the Institute issues bulletins reporting research and containing information of value to the citizens of the state and to the aeronautical industry. Limited extension service, advice, and help are available through the Institute to Illinois operators and communities having airports.

The Institute, in addition to academic instruction, publication activities, flight training, and aeronautical research, is responsible for the management of the Airport which is owned and sponsored by the University. The Airport, with an area of 762 acres, is located near U. S. Route 45, six miles southwest of the Illini Union Building on the Urbana campus. Its purpose is to implement a comprehensive program of aviation education and research, and to provide commercial and private landing facilities for the promotion of national air transport and defense. The Airport provides the University and the community with excellent air transportation terminal facilities, and also makes possible the effectuation of military aviation training programs. It provides the students with an opportunity to engage in flying activities, both as a part of general education and in connection with professional objectives. The administration, operation, and servicing activities of the Airport furnish students and faculty with an opportunity for laboratory study and research.

The land and rights-of-way for the Airport were purchased by the University from funds appropriated by the General Assembly of Illinois. The present completed facilities, financed by the Civil Aeronautics Ad-

ministration, through federal funds, and by the Department of Aeronautics of the state of Illinois, through state funds, consist of three concrete runways each 5,300 feet long and 150 feet wide; one turfed runway 4,000 feet long and 150 feet wide; a total of 12,000 feet of concrete taxiways 50 feet wide; and 89,000 feet of drainage. The large hangar, 360 by 100 feet, provides space for storage and shop activities. Attached to the large hangar is space for classrooms, operations offices, control tower, storage rooms, service utilities, and public rooms with a combined area of 11,000 square feet. Additional hangar space is contained in the two ten-ship units of T-hangars. Space for research and other educational activities is provided for in the five large Quonset-type buildings with a combined floor area of over 20,800 square feet. The aviation psychology research laboratory is located in one of these buildings. The night-lighting installation provides facilities for making the Airport operative at all times for both educational and commercial purposes.

### Requirements for Admission

Admission to the University of Illinois is handled by the Director of Admissions and Records. Courses offered by the Institute of Aviation are open to students and to faculty and staff members in all departments of the University. Any person wishing to enroll as a full-time student in the aircraft maintenance curriculum should apply for admission to the Institute of Aviation.

Students should apply to the Division of General Studies for admission to the professional pilot curriculum; to the College of Engineering for the aeronautical engineering curriculum; and to the College of Commerce and Business Administration for the airline-airport management curriculum.

All applicants for admission to the Institute of Aviation aircraft maintenance curriculum must have graduated from high school with a minimum of fifteen entrance units. Subjects required for admission are English, three units; algebra, one unit; and geometry, one unit. It is recommended that the applicant have two units each of industrial arts, science, and social studies. The student who does not have the subjects required for admission to the Institute may take the entrance examinations given each September. Information concerning these examinations can be secured at the office of the Director of Admissions and Records, 100a Administration Building, Urbana.

## Curriculum in Aircraft Maintenance

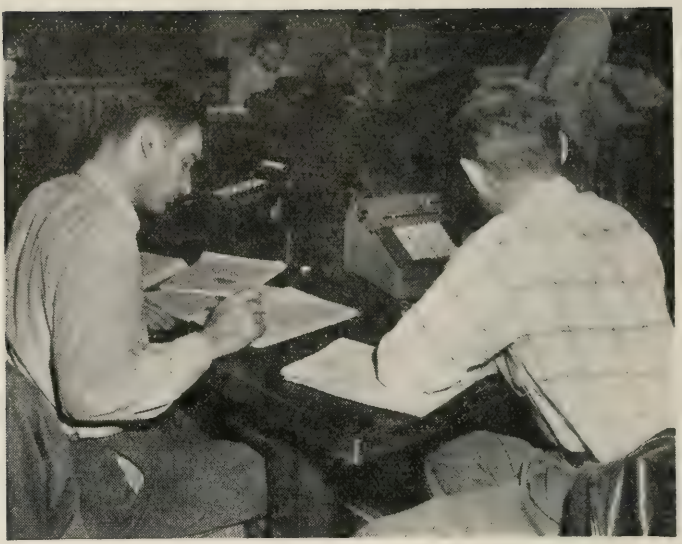
### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Avi. 151—Applied Aircraft Physics | 3 | Avi. 101—Private Pilot Course | 3 |
| Avi. 153—Aircraft Shop Practice | 3 | Avi. 150—Aircraft Engine Overhaul | 5 |
| Avi. 155—Aircraft Mathematics | 3 | Avi. 152—Aircraft Engine Accessory Overhaul | 5 |
| Avi. 157—Aircraft Engine Theory and Practice | 5 | Avi. 154—Aircraft Propellers | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | | |
| *Total* | 19 | *Total* | 18 |

## Second Year

| | | | |
|---|---|---|---|
| Avi. 161—Airport Shop Management | 3 | Avi. 158—Aircraft Overhaul | 3 |
| Avi. 163—Aircraft Woodworking | 2 | Avi. 160—Aircraft Rigging and Assembly | 2 |
| Avi. 165—Aircraft Welding | 2 | Avi 162—Aircraft Systems and Appliances | 3 |
| Avi. 167—Aircraft Sheet Metal | 2 | Avi. 164—Inspections, Forms, and Reports | 3 |
| Avi. 169—Aircraft Materials and Specifications | 1 | Avi. 168—Seminar | 2 |
| Avi. 171—Aircraft Finishing Methods | 3 | Elective | 3 |
| G.E.D. 105—Elements of Drawing | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | | |
| *Total* | 18 | *Total* | 18 |

College of Commerce and Business Administration



Statistical Laboratory

David Kinley Ha

# College of Commerce and Business Administration

Through training in modern business practices and in the fundamentals of economics, the College of Commerce and Business Administration seeks to develop in its students the abilities necessary for responsible positions in business and government. It offers a unified program of basic studies for freshmen and sophomores and a variety of fields of concentration for juniors and seniors. Though the factual contents of many of the courses are directly useful in specific vocations—accounting, banking, selling, teaching, and so forth—students should expect to serve an apprenticeship in the fields they enter after graduation from this college, if they wish to prepare themselves for higher positions. While concentrating in a special field, they are encouraged to elect courses offered in other colleges and schools of the University and to secure as liberal an education as possible to avoid the narrowing effects of specialization.

The program for the first and second years, the Lower Division, is organized around a nucleus of courses in accountancy and economics, mathematics and science, language and literature, rhetoric and speech. While this program is designed primarily as preparation for the third and fourth years of the curriculum, it affords a well-balanced combination of studies for those who are in college only two years in preparation for work in the business world. Students who have completed this two-year program with a satisfactory scholastic record are qualified for admission to the Upper Division of the College of Commerce and Business Administration, to the College of Education, or to the School of Journalism and Communications. Students transferring to other colleges after completing the two-year program of the Lower Division do not receive their degrees from the College of Commerce and Business Administration, but from the college to which they transfer, on completing the requirements of that college.

The program of the Upper Division includes fifteen fields of concentration, each student choosing the field he prefers: (1) accountancy, (2) commerce and law, (3) commercial teaching, (4) economics of public utilities, transportation, government, and business, (5) economic theory, (6) finance, (7) general economics, (8) industrial administration, (9) insurance, (10) labor economics, (11) management, (12) marketing, (13) personnel management, (14) secretarial training, (15) statistical economics. These fields overlap to some extent in that they deal with the common problems of business and public affairs. A student electing any one field of concentration ordinarily takes a substantial number of courses in the other fields. The program leads to the degree of Bachelor of Science in the chosen field. For degrees from both the College of Commerce and Business Administration and the College of Law, see Commerce and Law, page 81.

A few deviations from the foregoing programs of concentration make it possible for the student to prepare for a career in foreign trade, real estate, aviation administration, administrative positions in trade associations and chambers of commerce, and so forth.

To succeed in this program, a student should be thoroughly prepared in the basic work of the Lower Division or have equivalent training elsewhere. To be admitted to the Upper Division, each student must have at least sixty hours of credit, including the courses prescribed in the Lower Division. Students transferring from other colleges and universities are given opportunity without delay in their progress toward a degree to make up any Lower Division courses in which they may be deficient.

Students in this college who intend to enter the Graduate College are advised to arrange their programs so as to include the courses that are prerequisite for graduate work. Students intending to pursue work toward the doctorate are advised to acquire a reading knowledge of French and German.

## Departments and Divisions

Instruction in this college is organized under two departments, (1) the Department of Business Organization and Operation which is subdivided into the Divisions of Accountancy, Business Law, Management, Marketing, and Secretarial Training; and (2) the Department of Economics.

The Division of Accountancy conducts courses in general principles of accounting, auditing, cost accounting, income tax procedure, governmental accounting, budget control, and accounting systems. The Division of Business Law offers courses dealing with phases of law closely allied to business such as contracts, agency, and other subjects. The Division of Management conducts courses in the organization and administration of manufacturing industries. The Division of Marketing conducts courses in the management of distributing agencies and merchandising enterprises and in the principles and methods of advertising, marketing, and selling. The Division of Secretarial Training offers courses in advanced typewriting and shorthand, office management, records management, executive secretarial practice, office equipment, and advanced dictation and reporting.

The Department of Economics offers courses in economic history, economic theory, banking, consumer economics, economic forecasting, economics of communications, corporation finance, employment theory, fiscal and monetary theory, government-business relationships, international economics, insurance, investments, labor, personnel management, public finance, public utilities, statistics, transportation, welfare economics. This department cooperates with the Division of Social Sciences in the College of Liberal Arts and Sciences, and students in that college may make economics their major subject.

## Requirements for Graduation

A candidate for the degree of Bachelor of Science from the College of Commerce and Business Administration must meet the following requirements:

1. Fulfill the general University requirements with respect to registration, residence, scholarship, and fees.

2. Have a total of 130 credit hours (including the prescribed military and physical education) of which not less than sixty credit hours must be in courses in accountancy, business law, economics, management, and marketing (and secretarial training courses in the fields of commercial teaching and secretarial training only), except that in commercial teaching and commerce and law the requirement is forty-five hours; and in industrial administration and personnel management fifty hours.

3. Complete the requirements of one of the fields of concentration described subsequently.

4. Meet the grade requirements for graduation as follows:

Students who completed one semester or summer session or more in any branch or college of the University prior to the first semester of 1947-1948, regardless of the number of credit hours obtained, have the choice of:

a. Meeting the former requirements for graduation, namely, not more than fifteen hours of a grade of "D" in Lower Division courses (whether taken at this University or elsewhere) and a 3.0 average or above in Upper Division courses taken at the University and counted toward graduation; or

b. Meeting the current requirements, namely, an average of 3.0 or above for all courses counted toward graduation, whether taken at this University or elsewhere.

Students entering the University in the first semester of 1947-1948 or later must have an average of 3.0 or above for all courses counted toward graduation, whether taken at this University or elsewhere.

### Honors at Graduation

Honors awarded at graduation to superior students are designated on the diploma as Honors or High Honors. To be considered for honors, a student must have earned in residence at the University a minimum of sixty hours credit. The general University regulations for graduation with honors are given on page 26. In the College of Commerce and Business Administration one of the conditions for graduating with honors is a minimum of twelve hours of "A" in the primary list and technical list (if any) combined.

## General Curriculum

| I. University Requirements | HOURS | SEMESTER |
|---|---|---|
| Military | 4 | 1, 2, 3, 4 |
| Physical Education | 4 | 1, 2, 3, 4 |
| Rhetoric 101 | 3 | 1 |
| Rhetoric 102 | 3 | 2 |
| Hygiene 101 or 104 | 2[1] | 2 |
| | 16 | |
| **II. College General Education Requirements** | | |
| One of the following: | | |
| Econ. 138—Introduction to the Economic History of Modern Europe<br>Econ. 136—Economic History of the United States<br>Hist. 100—Introduction to General Social Sciences<br>Geog. 105—Economic Geography | 3[1] | 1 or 2 |
| Speech 101—Principles of Effective Speaking | 3 | 2, 3, or 4 |
| Rhet. 151—Business Letter Writing | 3 | 3 or 4 |
| Mathematics—one of the following: | | |
| Math. A<br>College Algebra | 3 to 5[2] | 1 or 2 |
| Science or Advanced Mathematics | 4[3] | 1 or 2 |

[1] These courses are for freshmen only and are not to be taken by students who have thirty or more credit hours.

[2] Students presenting two units of high school algebra are exempt from this requirement. Students presenting one unit of high school algebra must take five hours of Math. A or college algebra (Math. 111); students presenting 1½ units should take three hours of Math. A or college algebra (Math. 112).

[3] Courses to fulfill this four-hour requirement may be taken from the following subjects: astronomy, bacteriology, botany, chemistry, Division of General Studies (courses 131, 132, 141, 142 only), entomology, geography (except Geog. 105), geology, mathematics (in advance of algebra), physics, physiology, zoology.

| | | |
|---|---|---|
| Literature or Language[1] | 6 | Literature: 3, 4, 5, or 6<br>Language: 1, 2, 3, 4, 5, or 6 |
| Secondary List (history, philosophy, political science, psychology, sociology and anthropology) | 6 to 15 | 3, 4, 5, 6, 7, or 8 |
| Additional hours in last three areas (science or advanced mathematics, language or literature, and secondary list) or additional courses in humanities and fine arts to bring total hours in this group to a minimum of 39 | 9 to 0 | 3, 4, 5, 6, 7, or 8 |
| | 39 | |
| III. College General Business Education Requirements | | |
| Accy. 101 or 102—Principles of Accounting | 3 to 2 | 1 |
| Accy. 105—Accounting Procedure | 3 | 2 |
| Accy. 106—Elementary Cost Accounting, or Accy. 108—Intermediate Accounting | 3 | 3 |
| Bus. Law 201—General Principles of Business Law | 3 | 4, 5, 6, 7, or 8 |
| Econ. 102, 103—Principles of Economics | 6 | 3, 4 |
| Econ. 170—Elements of Statistics | 3 | 3 or 4 |
| Econ. 250—Money, Credit, and Banking | 3 | 5, 6, 7, or 8 |
| Econ. 254—Business Finance | 3 | 5, 6, 7, or 8 |
| Mgmt. 101—Industrial Organization and Management | 3 | 4, 5, 6, 7, or 8 |
| Mktg. 101—Principles of Marketing | 3 | 4, 5, 6, 7, or 8 |
| Electives from the following: Econ. 210, 214, 228, 240, 288, 300, 301, 306, 312, 336, 389 | 6 | 5, 6, 7, or 8 |
| | 38 to 39 | |
| IV. Field of Concentration and Free Electives | 37 to 36 | |
| *Total* | 130 | |

## Fields of Concentration

(Requirements are to be fulfilled during the last four semesters.)

Not more than twenty-seven hours in the designated major area (accountancy, economics, management, marketing, or secretarial training) in addition to those required in the College General Business Education Requirements, will be accepted in meeting the total of 130 hours required for graduation.

### Accountancy

For the Degree of Bachelor of Science in Accounting. Major area, Accountancy. For those who are preparing to follow governmental, industrial, commercial, or public accounting, or who wish to use the field of concentration in accountancy as a general training for a career in business.

[1] Students must obtain credit in at least eight hours of English and/or American literature or obtain a reading knowledge of a modern foreign language (French, German, Italian, Portuguese, Russian, Spanish) equivalent to that resulting from four semesters of study of a foreign language when commenced in college. For the purpose of this requirement a candidate is assumed to have a reading knowledge of a modern foreign language if he has passed French 104, German 104 or 144, Italian 104, Russian 204, Spanish 104, or a more advanced course in one of these languages, or if he has passed a proficiency examination equivalent to the final examination given in any of these courses. If a student has completed four years of one modern foreign language in high school, he does not have to take any literature or foreign language or pass a proficiency examination to demonstrate a reading knowledge of the language, in order to fulfill the requirements of the College of Commerce and Business Administration. Students expecting to elect government foreign service or foreign trade (see marketing, page 83) as a field of concentration are advised to choose the foreign language option.

Required: Accy. 108, 274, 308, 371, 377; Bus. Law 202; Rhet. 272; and at least three of the following: Accy. 324, 341, 362, 366, 372, 374, 378.

Suggestions: Students preparing for a specific phase of accounting should try to take specific courses therefor in accordance with the following suggestions: For governmental accounting—Accy. 341; Econ. 214, 216. For industrial and commercial accounting—Accy. 374, 362, 366; Mgmt. 301. For public accounting—Accy. 324, 372, 378.

#### Commerce and Law

For the Degree of Bachelor of Science in Commerce and Law. For those who wish to combine commercial and legal studies and obtain both the degrees of Bachelor of Science and Bachelor of Law in six years (see also requirements for graduation from the College of Law, page 166). In their fourth year, students who have earned at least 100 credit hours of prelaw work will be regularly registered in the College of Law, but must file copies of their program cards in the office of the Dean of the College of Commerce and Business Administration at the beginning of each semester.

Primary List: Including those courses otherwise required, a sufficient number of hours shall be selected from courses offered in the College of Commerce and Business Administration to make a total of forty-five hours of courses in accountancy, economics, management, and marketing.

Technical List: Thirty hours of law.

#### Commercial Teaching

For complete program, see page 85.

#### Economics of Public Utilities, Transportation, Government, and Business

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those wishing to prepare to enter public utility, transportation, or communication industries, or regulatory agencies of the government.

Required: Pol. Sci. 150, 151.

Group Electives: A total of fifteen hours selected from the following: Econ. 255, 280, 286, 288, 384, 385, 389, 390, 391.

Secondary List: A total of nine hours of social science, political science, sociology, history, psychology, philosophy.

Electives: A total of nine hours selected from related courses in economics, law, agricultural economics, political science, or other social sciences.

#### Economic Theory

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those who desire broad training in economic theory.

Required: Econ. 300, 301, 306.

Electives: Nine hours must be selected from courses offered by the Departments of Economics, Mathematics, Philosophy, Political Science, Psychology, and Sociology and Anthropology. These courses shall be chosen with the consent of the adviser.

#### Finance

For the Degree of Bachelor of Science in Finance. Major area, Economics. For those who desire a broad undergraduate preparation in public finance, banking, or business finance.

Required: Econ. 214.

Electives: At least twelve hours from the following: Econ. 216, 228, 252, 253, 255, 258, 259, 301, 315.

Supplementary List: At least twelve hours in related courses, such as the following, selected with the consent of an adviser in the field: Accy. 108, 274, 324, 341, 363; Agr. Econ. 302; Bus. Law 202, 301; Econ. 260, 262, 272, 280, 288, 300, 336, 384, 390; Mgmt. 311; Mktg. 211, 305, 345; Pol. Sci. 150, 151, 305, 312, 351, 361, 363.

#### General Economics

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those who wish a general course of study in economics.

Required: Econ. 300.

Group Electives: To avoid overspecialization in any one field, twenty-one hours must be selected from at least four of the following eight groups. Not more than six hours may be selected from one group.

1. Economic Theory and History: Econ. 210, 213, 238, 239, 288, 301, 306, 312, 336.
2. Finance and Banking: Econ. 252, 253, 255, 258, 259, 301.
3. Utilities and Transportation: Econ. 280, 286, 287, 384, 385, 389, 390.
4. Insurance and Statistics: Econ. 260, 262, 263, 271, 272, 363, 366, 371, 377.
5. Foreign Trade: Econ. 224, 226, 228, 328.
6. Labor: Econ. 240, 246, 248, 342, 343, 344, 346.
7. Public Finances: Econ. 214, 216, 315.
8. Income and Consumption: Econ. 375, 378, 379, 380.

#### Industrial Administration

For the Degree of Bachelor of Science in Industrial Administration. Major area, Management. For those who desire to combine commerce with engineering or with other technical work in an integrated program.

Required: Mgmt. 301; Econ. 248; Rhet. 272; at least six hours in management courses in addition to Mgmt. 101 and 301.

Technical List: At least eighteen additional hours in related technical electives appropriate to the student's course of study must be taken. At least twelve of these hours must be selected from courses in one of the following major groups, except that other selected technical majors may be permitted at the discretion of the faculty adviser in charge of industrial administration and the Dean of the College: architecture, chemistry, dairy technology, and any one department in the College of Engineering.

General Engineering Drawing 101 and 102 up to a total of six hours may be counted toward any major.

With the consent of the faculty adviser in charge of industrial administration and the Dean of the College, the remaining maximum of six hours of technical electives may be selected from any of the above groups related to the major, or from the following minor groups: accountancy, economics courses in the field of transportation only, marketing, and theoretical and applied mechanics.

Procedure: At the time of declaring the field of concentration near the end of the sophomore year, a petition should be filed in the office of the College of Commerce and Business Administration. The petition will include a statement of the objective which prompts selection of this field, applicable courses already completed, and technical electives submitted for approval to complete the program. This petition must be approved by the faculty adviser in charge of industrial administration and by the Dean of the College before registration in the first semester upon entering this field.

#### Insurance

For the Degree of Bachelor of Science in Economics. Major area, Economics. For students preparing for a career in the insurance business.

Required of all students in the curriculum: Econ. 260, 262, 342.

For students interested in life insurance:

Required: Econ. 363, 259; Bus. Law 302.

Electives: Six hours must be taken from the following: Econ. 258, 263, 288, 366, 380; Sociol. 100; Pol. Sci. 391; Law 351; Mktg. 271, 372, 373; Math. 171, 371; Bus. Law 202.

For students interested in property casualty insurance:

Required: Econ. 263, 366.

Electives: Nine hours must be taken from the following: Econ. 258, 288, 363, 380; Bus. Law 202, 301; Mgmt. 245; Mktg. 372, 373; Mech. Eng. 357; Math. 171; Pol. Sci. 391; Law 351.

#### Labor Economics

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those desiring to make a career in some phase of labor-management relations, in government service, industry, or the academic professions.

Required: Econ. 240, 248, 342, 344, 246.

Electives: Nine hours must be taken from the following: Econ. 210, 288, 343, 346, 380; Psych. 145, 357; Sociol. 318; Mgmt. 362; Pol. Sci. 391.

**Management**

For the Degree of Bachelor of Science in Management. Major area, Management. For those who desire a broad undergraduate preparation in management.

Required: Mgmt. 301, at least nine hours in management courses in addition to Mgmt. 101 and 301; Bus. Law 202; Econ. 248; Rhet. 272.

Suggested Electives: Accy. 108, 324, 362; Econ. 210, 214, 218, 228, 240, 259, 260, 271, 286, 300, 301, 306, 342, 344, 384; any management courses not included in those required in the curriculum; Mktg. 211, 271, 281, 321, 345; Sec. Tr. 241.[1]

**Marketing**

For the Degree of Bachelor of Science in Marketing. Major area, Marketing. For those planning to engage in any of the phases of marketing.

General Marketing. For students desiring broad general training in marketing. A minimum of twenty-one hours, including all the required courses, must be selected from:

Required: Mktg. 211, 271, 281, 305.

Electives: Mktg. 212, 282, 288, 315, 321, 323, 325, 331, 332. 333, 334, 345, 349, 372, 373, 382, 383, 384, 385, 386, 387; Accy. 108; Bus. Law 202; Econ. 260, 262, 263, 271, 272, 287, 288, 300, 371, 378, 379, 384; Mgmt. 204, 245, 311, 312; Rhet. 272.

For students desiring specialized training in advertising, agricultural marketing, foreign marketing, marketing research, retailing, sales and advertising management, selling, trade and commercial association management, or transportation and traffic management. A minimum of twenty-one hours must be selected from one of the following sub-fields, including all the required courses in the selected sub-field:

Advertising[2]

Required: Mktg. 271, 281, 382, 383, 384.

Electives: Mktg. 211, 288, 305, 321, 323, 386, 387; Journ. 204.

Agricultural Marketing

Required: Mktg. 271, 281, 331, 332, 333, 373.

Electives: Mktg. 211, 282, 305, 321, 334, 345, 387; Econ. 224; Mgmt. 245, 311.

Foreign Marketing

Required: Mktg. 271, 281, 305; Econ. 224, 226.

Electives: Mktg. 321, 345, 349, 372, 373; Econ. 228, 238, 260, 328, 384; foreign languages.

Marketing Research

Required: Mktg. 271, 281, 321, 323, 373; Econ. 271.

Electives: Mktg. 211, 305, 315, 325, 345, 373, 387; Accy. 108, 366; Econ. 272, 301, 371, 373, 379; Mgmt. 245; Rhet. 272.

Retailing

Required: Mktg. 211, 212, 271, 315, 345.

Electives: Mktg. 281, 282, 305, 321, 372, 384, 387; Accy. 108; Art 111, 112, 115, 185, 186; Bus. Law 202; Econ. 248, 260, 263, 378; Home Econ. 120, 125, 130, 161, 162, 180, 182, 185, 190, 262, 271, 380, 395; Mgmt. 204, 245.

Sales and Advertising Management

Required: Mktg. 271, 281, 282, 373, 387.

Electives: Mktg. 211, 212, 288, 305, 321, 323, 325, 345, 372, 383, 384, 385, 386; Econ. 248, 378; Journ. 204.

Selling

Required: Mktg. 271, 281, 345, 372, 373.

Electives: Mktg. 211, 212, 282, 288, 305, 315, 321, 349, 384, 387; Econ. 248; Mgmt. 204.

Electives for those interested in insurance: Bus. Law 202, 302; Econ. 260, 262, 263, 363, 366.

[1] Credit earned in this course fulfills part of the sixty credit hour requirement of commerce courses. (See Requirements for Graduation, Item 2, page 78.)

[2] A similar program is offered in the School of Journalism and Communications for journalism students majoring in advertising.

Trade and Commercial Association Management
Required: Mktg. 211, 321, 345, 349; Econ. 214.
Electives: Mktg. 212, 271, 281, 305, 323, 384; Econ. 216, 248, 260, 280, 288, 384; Journ. 218, 309; Land. Arch. 271, 272; Mgmt. 245; Pol. Sci. 110, 305, 361, 362; Rhet. 272.
Transportation and Traffic Management
Required: Mktg. 271, 305, 321; Econ. 286, 287, 384.
Electives: Mktg. 281, 282, 373, 387; Bus. Law 202; Econ. 240, 248, 385; Eng. 140; Mgmt. 204, 252.

#### Personnel Management

For the degree of Bachelor of Science in Management. For those who wish to study the problems which arise out of the relationships between employer and employee, or who wish to prepare themselves for affiliation with personnel departments in industry, commerce, or public or private institutions.

Group I. The following twelve hours are required: Psych. 100, 145; Econ. 240, 248.
Group II. Nine hours must be selected from the following: Econ. 246, 344; Mgmt. 311, 362; Sociol. 318; Psych. 290; Pol. Sci. 365.
Group III. Twelve hours must be selected from any one of the three groups listed below:
Industrial: Econ. 260; Mgmt. 205, 221, 245, 301, 312; M.E. 233, 357; Psych. 338, 383. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 362; Sociol. 318; Psych. 290.
Merchandising: Econ. 288; Mgmt. 245, 312; Mktg. 211, 212, 271, 315, 373; Psych. 338, 383. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 362; Sociol. 318; Psych. 290.
Public Administration: Pol. Sci. 150, 356, 361, 362, 363; Econ. 214, 288, 344; Psych. 338, 383; Mgmt. 245. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 311; Sociol. 318; Psych. 290.

#### Secretarial Training

For the degree of Bachelor of Science in Secretarial Training. Major area, Secretarial Training. For those who wish to prepare for secretarial work requiring a high degree of technical skill and broad business education.

Required: Sec. Tr. 101, 102, 103, 111, 112, 113, 222, 233, and 241 (previous training in typewriting and shorthand will determine course level at which student begins); Econ. 248; Mgmt. 245, 246; Rhet. 272.

#### Statistical Economics

For the degree of Bachelor of Science in Economics. Major area, Economics. For those who are preparing to do quantitative research in the fields of economics and business.

General Course
Required: Econ. 271, 371, 374, 377.
Technical Requirements: Math. 132, 142, 363.
Electives: Nine hours from the following: Econ. 336, 372, 373 (Econ. 372 and 373 may be substituted for Econ. 271 on the required list), 375, 376, 379; Accy. 108, 308, 324, 341, 362, 371; Mktg. 305; Math. 343, 364, 366, 369, 373.

Specialization Groups. Students wishing to prepare especially for research in one of the following specialization groups may substitute from three to twelve hours from one of the following specialization groups for the equivalent number of hours in the electives under the General Course above, and Math. 363 in the technical requirements above.

Labor Combination
Required: Econ. 240, 343, 376.
Electives: Econ. 210, 246, 248, 346, 375; Sociol. 318; Psych. 145; Mgmt. 205.
Personnel Combination
Required: Psych. 290; Econ. 240, 248.
Electives: Psych. 145; Econ. 376; Sociol. 318; Mgmt. 205, 221, 312.
Marketing Combination
Required: Mktg. 305, 321.
Electives: Mktg. 271, 323, 381, 383, 385, 386, 387; Econ. 372, 375, 379.

Finance Combination
Required: Econ. 214, 259.
Electives: Econ. 228, 260, 375; Accy. 108, 308, 324, 362; Math. 371, 372; Mktg. 345.
Management Combination
Required: Courses to be announced.
Electives: Math. 368; M.E. 233; Mgmt. 205, 221, 301, 311.
Income and Consumption Combination
Required: Econ. 375, 379.
Electives: Econ. 372, 377; Anthrop. 107.
Other combinations may be approved by an adviser to adapt the program of study to training requirements in individual cases.

## Curriculum Preparatory to Teaching Commercial Subjects

*For the Degree of Bachelor of Science in Commercial Teaching*

A minimum of 130 hours of credit, counting the first two years in military and physical education, is required for graduation. A minimum of forty-five credit hours is required in accountancy, business law, economics, management, marketing, and secretarial training.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 111—Verbal Communication[1] | 4 | D.G.S. 112—Verbal Communication[1] | 4 |
| D.G.S. 131—Biological Science, or Bot. 100—General Botany[2] | 4 | D.G.S. 132—Biological Science, or Zool. 104—General Zoology[2] | 4 |
| Econ. 238—Economic Development of Modern Europe, or D.G.S. 121—History of Civilization | 3 or 4 | Econ. 239.—Economic Development of Modern Europe, or D.G.S. 122—History of Civilization | 3 or 4 |
| Math. 111 or 112—Algebra | 3 or 5 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Physical Education | 1 | Hygiene 101—Health Lectures[3] | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 16 to 18 | *Total* | 16 to 18 |

[1] Rhet. 101, 102, and Speech 101 may be taken instead of D.G.S. 111 and 112.
[2] Recommended for teachers. In certain instances, substitutions may be chosen from the following list of sciences: astronomy, bacteriology, botany, chemistry, entomology, geography (except Geog. 105), geology, mathematics, physics, physical science (D.G.S. 141-142), physiology, and zoology.
[3] Hygiene 104 may be taken instead of Hygiene 101 with the approval of the adviser.

## Second Year

| | | | |
|---|---|---|---|
| Accy. 101—Principles of Accounting | 3 | Accy. 105—Accounting Procedure | 3 |
| Econ. 102—Principles of Economics | 3 | Econ. 103—Principles of Economics | 3 |
| Geog. 105—Introduction to Economic Geography | 3 | Hist. 152—History of the United States, 1865-1951, or Pol. Sci. 150—American Government | 3 |
| Sec. Tr. 101—Beginning Typewriting | 2 | Sec. Tr. 102—Intermediate Typewriting | 2 |
| Sociol. 100—Principles of Sociology, or Sociol. 104—Community and Society, or D.G.S. 151—Social Science | 3 or 4 | Sec. Tr. 111—Beginning Shorthand[2] | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives[1] | 1 or 2 | Electives[1] | 2 |
| *Total* | 18 | *Total* | 18 |

## Third Year

| | | | |
|---|---|---|---|
| Accy. 106—Elementary Cost Accounting | 3 | Ed. 201—Foundations of American Education | 2 |
| Mktg. 101—Principles of Marketing | 3 | Ed. 240—Principles of Secondary Education | 2 |
| Psych. 100—Introduction to Psychology | 4 | Mktg. 271—Salesmanship, or Mktg. 281—Introduction to Advertising | 2 or 3 |
| Sec. Tr. 103—Advanced Typewriting | 2 | Rhet. 151—Business Letter Writing | 2 or 3 |
| Sec. Tr. 112—Intermediate Shorthand | 3 | Secretarial Practice,[2] or Sec. Tr. 113—Advanced Shorthand, or Mktg. 211—Principles of Retailing, or Accy. 108—Intermediate Accounting | 3 |
| Electives[1] | 2 | Electives[1] | 3 |
| *Total* | 17 | *Total* | 15 or 16 |

## Fourth Year

| | | | |
|---|---|---|---|
| American or English Literature, or Humanities 211—Growth of American Culture, or Phil. 104—Philosophy of Democracy, or Phil. 105—Moral Ideas and Practice | 2 to 4 | Ed. 211—Educational Psychology | 3 |
| Bus. Law 261—Summary of Business Law | 3 | Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Electives[1] | 8 to 10 | Ed. 242—Educational Practice in Secondary Education | 5 |
| *Total* | 15 | *Total* | 13 |

## Fifth Year

*For the Degree of Master of Science in Commercial Teaching*

I. **Economics.** A sufficient number of hours in approved advanced undergraduate and graduate courses in economics must be taken to bring the total credit hours in this subject to not less than seventeen for the five years.

II. **Business Law, Management, and Marketing.** A sufficient number of hours in approved advanced undergraduate and graduate courses in business law, management, and marketing must be taken to bring the total credit hours in this group of subjects to not less than seventeen for the five years.

[1] Suggested electives are: Econ. 250, 254; Mgmt. 101, 245, 246; Mktg. 212, 281, 372; Psych. 150, 155. Electives shall be chosen with the consent of the adviser. Students preparing to be supervisors or coordinators of cooperative programs will be required to take a minimum of eight semester hours of professional preparation to include Ed. 381, Principles of Vocational Education, 3 hours; Ed. 355, The Cooperative Program in Business Education, 3 hours; Ed. (new), Problems of Coordinating Business Education Programs, 2 hours.

[2] Students not electing shorthand sequence will have this as an elective.

III. **Accountancy.** A sufficient number of hours in approved advanced undergraduate and graduate courses in accountancy must be taken to bring the total credit hours in this subject to not less than seventeen for the five years, excluding Accy. 121.

IV. **Education.** Two of the following courses: Ed. 301, 302, 303, 304; and Ed. 311 and 312.

V. **Commerce.** Sufficient work must be taken in the fifth year in courses recognized for graduate credit to bring the total hours in commerce courses to not less than sixty for the five years.

VI. **Electives.** Nine hours of approved advanced undergraduate and graduate courses having general educational value, and of courses which bear directly on subjects taught in high schools.

VII. **Summary.** The requirements of I-V, above, can be satisfied with a minimum of twenty-three hours of credit; with the nine hours of electives (VI), this makes a total of thirty-two hours in the fifth year, or 162 hours for the five-year program.

The maximum required credit hours for electives during the third, fourth, and fifth years in commerce fields are as follows: business law, management, and marketing, six hours; economics, nine hours; accountancy, five hours.

For the purpose of evaluating units of credit in graduate courses in terms of credit hours in undergraduate courses, one unit is considered the equivalent of four semester hours.

## UNDERGRADUATE COMMERCE MINORS FOR NON-COMMERCE STUDENTS

### Shorthand and Typewriting

| | HOURS |
|---|---|
| Sec. Tr. 101, 102, 103—Typewriting | 6 |
| Sec. Tr. 111, 112, 113—Shorthand | 9 |
| Rhet. 151—Business Letter Writing | 2 |
| Mgmt. 246—Office Equipment | 3 |
| *Total* | 20 |

### Bookkeeping

| | |
|---|---|
| Accy. 101 or 102—Principles of Accounting | 3 or 2 |
| Accy. 105—Accounting Procedure | 3 |
| Accy. 106—Elementary Cost Accounting | 3 |
| Accy. 108—Intermediate Accounting | 3 |
| Electives (Accy. 121—Business Computations; Accy. 308—Advanced Accounting; Bus. Law 201-202—General Principles of Business Law; Mktg. 101—Principles of Marketing) | 4 or 5 |
| *Minimum Total* | 16 |

### General Commerce

| | |
|---|---|
| Accy. 121—Business Computations | 3 |
| Accy. 201—Fundamentals of Accounting | 3 |
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 108—Elements of Economics | 3 |
| Mgmt. 101—Industrial Organization and Management | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| *Total* | 18 |

College of Education

French Class at University High School

# College of Education

The College of Education prepares students for careers in teaching, special educational services, and administration. Courses and curricula offered at the undergraduate level lead to teacher certification. The courses of study are supplemented by supervised practice in teaching in school systems cooperating with the college.

Candidates for baccalaureate degrees in the College of Education take certain required courses and elect other courses in this college. They prepare themselves further for their chosen teaching fields by concentrating in restricted groups of subjects in other colleges and schools of the University. For those who wish to concentrate in the fields of elementary education, home economics education, education of deaf and hard-of-hearing children, education of mentally handicapped children, or industrial education, specialized curricula are provided in this college, each leading to the degree of Bachelor of Science. In the fields of other teaching subjects, sequences of courses comparable to these curricula are arranged for individual students by advisers.

## Requirements for Admission

The curricula in the education of deaf and hard-of-hearing children, education of mentally handicapped children, elementary education, and industrial education begin with the first year. Junior standing and an average of 3.5 are required for admission to all other curricula. The two years of study required for admission may be completed in any college approved by the University. Juniors entering from the College of Liberal Arts and Sciences should have completed the prescribed subjects and group requirements of the general curriculum or the first two years of work in the Division of General Studies. A junior entering from any other college of the University should have completed the first two years of a regular curriculum, and anyone transferring from another institution must have acceptable credit for an equivalent amount of work in that institution.

Students in the College of Education who are preparing for graduate work should arrange their undergraduate programs to meet the requirements for admission to the Graduate College. Those who desire positions as librarians may obtain professional training in the Library School. Special programs leading to the degrees of Master of Education and Doctor of Education are described in the catalog of the Graduate College.

## Requirements for Graduation

Each candidate for a baccalaureate degree in the College of Education must meet the general University requirements with respect to registration, residence, fees, hygiene, military training, physical education, and rhetoric. Students who are preparing for elementary education, home economics education, education of deaf and hard-of-hearing children, education of mentally handicapped children, or industrial education must meet the specific requirements of their curriculum with a satisfactory scholastic average. Students who are preparing for other teaching fields must secure credit, with a satisfactory scholastic average, in approved courses totaling at least 120 semester hours, including the credit accepted for admission to this college, but not counting the first two years of the required work in military and physical education.

## Prescribed Subjects

Twenty hours in education, including the following courses: Foundations of American Education, 2 hours; Educational Psychology, 3 hours; Technic of Teaching in the Secondary School, 3 hours; a teachers' course in the subject of specialization, 2 hours; Principles of Secondary Education, 2 hours; and Educational Practice, 5 hours. (A 3.5 average is prerequisite to Educational Practice.)

## Subjects of Specialization

Students who are preparing for elementary education, home economics education, education of deaf and hard-of-hearing children, education of mentally handicapped children, or industrial education follow the special curriculum in their field.

Students who are preparing for other teaching fields must specialize in two or three subjects selected from the following list. A student who elects to specialize in two subjects must complete at least thirty-two hours of approved courses in his first subject of specialization and at least sixteen hours of approved courses in his second subject of specialization. A student who elects to specialize in three subjects must complete at least twenty hours of approved courses in his first subject of specialization, and at least sixteen hours of approved courses in his second and third subjects of specialization. In computing the hours in the subjects of specialization, courses taken in other colleges prior to admission may be counted.

*Art*

*Biology* (a well-balanced program selected from zoology, physiology, entomology, botany, bacteriology. For a first subject of specialization, 25 to 32 hours are required; and for a second subject of specialization, 18 to 22 hours are required)

*Chemistry*

*Civics* (includes political science and sociology with a minimum of 8 hours in either subject)

*Commercial Subjects* (includes accountancy, business law, business letter writing, management, marketing)

*Economics*

*English* (includes courses in English literature, American literature, and rhetoric)

*French*

*General Science* (from 32 to 35 hours of beginning sciences for a first subject of specialization; from 20 to 25 hours for a second subject. The total should include at least one year of work in the physical sciences and one year in the biological sciences)

*Geography* (includes geology)

*German*

*History*

*Home Economics*

*Industrial Education* (includes industrial arts)

*Journalism* (as a second or third subject of specialization)

*Latin*

*Mathematics*

*Music*

*Physical Education for Men*

*Physical Education for Women*

*Physics* (includes courses in theoretical and applied mechanics)

*Physiology* (includes Hygiene 110)

*Spanish*

*Speech* (minimum of 16 hours in speech; the remainder may be English literature and American literature)

NOTE: All students are urged to confer with a placement consultant in the Office of Teacher Placement concerning the combinations of subjects most frequently requested by the high schools of the state and the standard of preparation usually demanded.

## Electives

The remainder of the curriculum may be elected, with the approval of the student's adviser, from courses offered by other colleges and schools in the University.

## Curriculum Preparatory to Teaching in the Elementary School

*For the Degree of Bachelor of Science in Elementary Education*

This four-year curriculum is designed to meet the requirements for teaching in the elementary and kindergarten-primary grades of Illinois schools. A minimum of 124 semester hours, exclusive of required physical education and military training, are necessary for graduation under this curriculum.

For admission to the curriculum, freshmen must meet the general entrance requirements for admission to the University. In general, admission of transfer students, either from other institutions or from other colleges of the University of Illinois, is limited to students having a grade-point average of 3.5 or higher, in terms of the University of Illinois grading system. Admission of transfer students whose scholastic average is below 3.5 is considered on petition in individual cases. Petitions for admission are considered by a committee which makes recommendations to the Dean of the College of Education.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 232) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 232) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### Summary

| | HOURS |
|---|---|
| **Language Arts** | |
| Rhet. 101, 102, and Speech 101 (or 141), or D.G.S. 111 and 112 | 8 to 9 |
| Engl. 101 and 102, or Engl. 111 and 112, or Engl. 113 and 114, or Engl. 121 and 122 | 6 to 8 |
| Lib. Sci. 303 | 3 |
| Elective in Language Arts Area | 0 to 3 |
| *Total Required* | 20 |
| **Natural Science** | |
| Biological Science (ten hours required): | |
| Bot. 100 and Zool. 104, or D.G.S. 131 and 132, or Entom. 103 and Bot. 100, or Entom. 103 and Zool. 104. | 8 |
| Hygiene 101 | 2 |
| Physical Science (eight hours required): | |
| D.G.S. 141 and 142, or an approved sequence of eight hours from astronomy, geology, physical geography, chemistry, and physics | 8 |
| *Total Required* | 18 |
| Psychology 100 | 4 |
| **Social Science** | |
| D.G.S. 151 and 152, or Hist. 111 and 112, or Phil. 103 and 104, or Sociol. 104 and 105 | 8 |
| Geog. 104 | 3 |
| Hist. 152 | 3 |
| Pol. Sci. 150 | 3 |
| Elective from Social Science Area | 3 |
| *Total Required* | 20 |
| Mathematics 202 | 5 |
| **Health and Physical Education** | |
| Required Physical Education | 4 |
| P.E.W. 220 | 2 |
| *Total Required* | 6 |

| | |
|---|---|
| Fine and Applied Arts | |
| Art 115, 170, 171, 173, 175, or 177 | 2 or 3 |
| Art 203 | 2 |
| Ed. 337 | 3 |
| Music 212 and 213 | 6 |
| *Total Required* | 13 or 14 |
| Professional Courses in Education (101, 201, 230, 231, 232, 233, 236, 237, and 336) | 25 |
| Electives (exclusive of above area electives) | 17 or 18 |
| Persons preparing for the kindergarten-primary certificate will be required to take the following six hours in addition to the above: | |
| Ed. 234 | 3 |
| Ed. 235 or S.W.A. 221 | 3 |

## Curriculum in Art Education

*For the Degree of Bachelor of Fine Arts in Art Education*

(See page 140)

## Curriculum in Home Economics Education

*For the Degree of Bachelor of Science in Home Economics Education*

This four-year curriculum, totaling 120 semester hours, is designed to meet the requirements for certification of teachers of home economics by the State Superintendent of Public Instruction. The first two years of work in this curriculum may be taken in the College of Agriculture (see page 63), or in the College of Liberal Arts and Sciences (see page 176), or in any other college approved by the University. The third and fourth years may be taken in the College of Education by students who meet requirements for admission to this college.

### Summary

Those who wish to meet the requirements of the State Board for Vocational Education should see the curriculum in vocational home economics education on page 66.

| | HOURS |
|---|---|
| Art 185, 186 | 4 |
| Bact. 104 and/or 105[1] | 3 to 5 |
| Chem. 101 (or 102), 105, 132 | 11 to 13 |
| Econ. 108 | 3 |
| Education: | |
| *Vocational:* Ed. 101, 201, 211, 240, 241, 242, 381; Home Econ. 277 | 23 |
| *Non-vocational:* Ed. 101, 201, 211, 240, 241, 242; Home Econ. 277 | 20 |
| Hist. 151 or 152 | 3 |
| Home Economics: | |
| *Vocational:* Home Econ. 130, 131, 161, 162, 170, 180, 182, 185, 186, 201, 202, 220, 228, 232, 272, 273, 286 | 42 |
| *Non-vocational:* Home Econ. 130, 131, 161 or 162, 170, 180, 182, 185, 201, 232, 272, and a minimum of eight hours from 186, 202, 205, 220, 273, 286 | 32 to 41 |
| Hygiene 101 | 2 |
| Literature | 4 |
| Physical Education (four semesters) | 0 |
| Physiol. 103[1] | 4 |
| Pol. Sci. 150 or 151 | 3 |
| Psych. 100 | 4 |
| Rhet. 101 and 102, and Speech 101, or D.G.S. 111 and 121 | 8 or 9 |
| Sociol. 100 | 3 |
| *Total Required for Graduation* | 120 |

[1] Each student must take at least eight hours in physiology and bacteriology.

## Curriculum in Industrial Education

*For the Degree of Bachelor of Science in Industrial Education*

This four-year curriculum, totaling 120 semester hours, is offered entirely in the College of Education, which admits freshmen for this purpose. Students completing this curriculum qualify for certification by the State Superintendent of Public Instruction and in some cases by the State Board of Vocational Education. Modifications of the work shown in the following outline may be made to meet special needs, particularly for teachers already in service. Minor teaching subjects recommended are chemistry, mathematics, physics, or social studies.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 111—Verbal Communication, or Rhet. 101—Rhetoric and Composition[1] | 4 or 3 | Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures | 2 | D.G.S. 112—Verbal Communication, or Rhet. 102—Rhetoric and Composition[1] | 4 or 3 |
| Ind. Ed. 181—Industrial Arts | 4 | G.E.D. 101—Elements of Drawing | 4 |
| Math. 111—Algebra,[2] or Elective | 5 or 3 | Ind. Ed. 184—Advanced Metal Work | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 14 to 17 | *Total* | 16 to 19 |

### Second Year

| | | | |
|---|---|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 | Engl. 114—American Literature, or Other Humanities Electives | 3 |
| G.E.D. 102—Descriptive Geometry | 4 | Ind. Ed. 182—Advanced Course in Woodwork | 4 |
| Hist. 152—History of the United States, 1865-1951 | 3 | Pol. Sci. 150—American Government | 3 |
| Ind. Ed. 183—The General Shop | 4 | Psych. 100—Introduction to Psychology | 4 |
| Math. 114—Plane Trigonometry | 2 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Electives | 2 |
| *Total* | 17 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| Arch. 143—Materials and Methods of Construction | 3 | Agr. Eng. 142—Gas Engines and Tractors, or Journ. 204—Typography | 3 or 2 |
| Ed. 383—Problems of Industrial Education | 3 | Arch. 144—Materials and Methods of Construction | 3 |
| M.E. 181—Metal Processing | 4 | Ed. 201—Foundations of American Education | 2 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 | Ed. 240—Principles of Secondary Education | 2 |
| Electives | 3 | M.E. 183—Materials Casting | 3 |
| | | Electives | 3 |
| *Total* | 18 | *Total* | 15 or 16 |

[1] Those taking Rhet. 101 and 102 must register later for Speech 101 or 141.
[2] Required of those who enter with only one unit of high school algebra.

### Fourth Year

| | | | |
|---|---|---|---|
| Avi. 153—Aircraft Shop Practice, or Agr. Eng. 242—Advanced Gas and Diesel Engines and Tractors | 3 | Ed. 211—Educational Psychology | 3 |
| Ed. 381—Principles of Vocational Education | 3 | Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 385—Principles of Vocational Guidance | 3 | Ed. 242—Educational Practice in Secondary Education | 5 |
| Eng. 239—Industrial Relations | 3 | M.E. 231—Advanced Metal Processing, or Elective | 3 |
| Electives | 6 | Electives | 3 |
| *Total* | 18 | *Total* | 17 |

## Curriculum Preparatory to Teaching Deaf and Hard-of-Hearing Children

*For the Degree of Bachelor of Science in the Education of the Deaf*

A student who wishes to enter the curriculum for the education of the deaf and the hard-of-hearing must (1) rank in the upper 25 per cent of his high school graduating class or, if a transfer student, must have an average of at least 3.5; and (2) possess normal hearing acuity and normal formation of the teeth and lips. A personal interview with a staff member of the College of Education is required.

A minimum of 124 hours of credit, not counting the first two years of work in military training and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 220) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 220) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 131—Biological Science, or Physiol. 110-111—Elementary Mammalian Physiology[1] | 4 or 5 | D.G.S. 132—Biological Science, or Physiol. 106—Physiology of the Nervous System and the Special Senses | 4 or 3 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Hygiene 101—Health Lectures | 2 |
| Speech 101—Principles of Effective Speaking[2] | 3 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 4 or 5 | Electives | 7 or 8 |
| *Total* | 15 to 19 | *Total* | 16 to 20 |

[1] This requirement will be waived for students who have completed general zoology or an acceptable equivalent.

[2] Students who take D.G.S. 111 and 112 are not required to take Speech 101.

## Second Year

| | | | |
|---|---|---|---|
| D.G.S. 151—Social Science[1] | 4 | D.G.S. 152—Social Science[1] | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 | D.G.S. 162—Literature and Fine Arts | 4 |
| Pol. Sci. 150—American Government | 3 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Psych. 100—Introduction to Psychology | 4 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| | | Electives | 2 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

## Third Year

| | | | |
|---|---|---|---|
| Art 203—Art Education Laboratory, or Arts and Crafts Electives[2] | 2 | Ed. 218—Remedial Reading in the Elementary School | 3 |
| Ed. 236—Child Development for Elementary Teachers | 3 | Ed. 230—Principles of Elementary Education | 2 |
| Ed. 317—Exceptional Children | 3 | Ed. 237—Child Development for Elementary Teachers | 3 |
| Speech 301—Introduction to Phonetics | 3 | Speech 375—Speech Science | 3 |
| Speech 385—Speech Correction | 4 | Speech 395—Audiometry and Use of Hearing Aids | 3 |
| Electives[3] | 2 or 3 | Electives[3] | 3 |
| *Total* | 17 or 18 | *Total* | 17 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 220—Educational Practice in the Education of Exceptional Children | 3 | Ed. 220—Educational Practice in the Education of Exceptional Children | 5 |
| Ed. 231—Technic of Teaching in the Elementary School | 3 | Ed. 320—Special Education of the Deaf | 5 |
| Ed. 232—Educational Practice in Elementary Education | 2 | Ed. 324—Mental and Educational Measurement of Exceptional Children | 3 |
| Ed. 319—Special Education of the Deaf | 5 | Electives[3] | 2 or 3 |
| Electives[3] | 2 or 3 | | |
| *Total* | 15 or 16 | *Total* | 15 or 16 |

[1] D.G.S. 151 and 152 will be waived for students who have completed Sociol. 100 and one additional three-hour course in sociology.

[2] Students may satisfy this requirement by taking Ind. Ed. 181, or by taking four hours selected from Art 170, Home Econ. 196, or the equivalent.

[3] Electives should be selected with consent of adviser. A maximum of forty-four credits in education will be allowed toward graduation.

### Fifth Year

*For the Degree of Master of Science in Education of the Deaf*

For admission to the curriculum for the degree of Master of Science in the Education of the Deaf, one of the following prerequisites is necessary: (1) a bachelor's degree in elementary or special education (other than the education of the deaf); or (2) a bachelor's degree in education of the deaf from an accredited training center for teachers of the deaf.

Candidates for the degree must earn a minimum of eight units as follows:

| | UNITS |
|---|---|
| I. Required of all students: | |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following courses: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| II. Required of students qualified under prerequisite 1: | |
| Ed. 317—Exceptional Children | ½ |
| Ed. 319—Special Education of the Deaf | 1 or 1½ |
| Ed. 320—Special Education of the Deaf | 1 or 2 |
| Speech 301—Introduction to Phonetics | ½ |
| Speech 385—Speech Correction | ½ |
| Speech 395—Audiometry and the Use of Hearing Aids | ½ |
| III. Required of students registered under prerequisite 2: | |
| Ed. 418—Problems in Communication for the Deaf | 1 |
| Ed. 449—Independent Study | 1 |
| IV. Electives to be chosen from the following: | |
| Ed. 381—Principles of Vocational Education | 1 |
| Ed. 412—Advanced Child Development for Students of Education | 1 |
| Ed. 425—Educational and Vocational Guidance | 1 |
| Ed. 426—Diagnostic and Remedial Programs of the School | 1 |
| Ed. 430—Elementary School Organization and Administration | 1 |
| Ed. 438—Supervision of the Elementary School | 1 |
| Ed. 440—Administration and Supervision of Junior and Senior High Schools | 1 |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education | 1 |
| Ed. 460—Educational Administration | 1 |
| Psych. 465—Practice in Psychological Testing | 1 |
| Psych. 412—Advanced Child Psychology | 1 |
| Speech 375—Speech Science | ½ |
| Speech 388—Speech Correction | ½ |
| Speech 488—Diagnosis of Speech Disorders | 1 |
| Speech 489—Seminar in Organic Speech Disorders | 1 |

## Curriculum Preparatory to Teaching Mentally Handicapped Children

*For the Degree of Bachelor of Science in the Education of Mentally Handicapped Children*

A student who wishes to enter the curriculum for the education of the mentally handicapped must (1) rank in the upper 25 per cent of his high school graduating class or, if a transfer student, must have an average of at least 3.5; and (2) possess normal hearing acuity and normal formation of the teeth and lips. A personal interview with a staff member of the College of Education is required.

A minimum of 124 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 220) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 220) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Arts and Crafts[1] | 4 | D.G.S. 132—Biological Science, or Physiol. 106—Physiology of the Nervous System and the Special Senses | 4 or 3 |
| D.G.S. 131—Biological Science, or Physiol. 110-111—Elementary Mammalian Physiology[2] | 4 or 5 | Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Physical Education | 1 | Speech 101—Principles of Effective Speaking[3] | 3 |
| Military (men) | 1 | Physical Education | 1 |
| Electives | 3 | Military (men) | 1 |
| | | Electives | 3 |
| *Total* | 15 to 18 | *Total* | 15 to 18 |

## Second Year

| | | | |
|---|---|---|---|
| D.G.S. 151—Social Science[4] | 4 | D.G.S. 152—Social Science[4] | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 | D.G.S. 162—Literature and Fine Arts | 4 |
| Pol. Sci. 150—American Government | 3 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Psych. 100—Introduction to Psychology | 4 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| | | Electives | 2 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

## Third Year

| | | | |
|---|---|---|---|
| Ed. 236—Child Development for Elementary Teachers | 3 | Ed. 218—Remedial Reading in the Elementary School | 3 |
| Ed. 317—Exceptional Children | 3 | Ed. 230—Principles of Elementary Education, or Ed. 240—Principles of Secondary Education | 2 |
| Ed. 324—Mental and Educational Measurement of Exceptional Children, or Psych. 150—Character and Personality, or Psych. 283—Psychology of Adjustment | 3 or 4 | Ed. 237—Child Development for Elementary Teachers | 3 |
| Speech 385—Speech Correction,[5] or Speech 208—Classroom Problems in Speech Correction | 3 | Electives | 7 to 9 |
| Electives | 4 | | |
| *Total* | 16 or 17 | *Total* | 15 to 17 |

[1] Students may satisfy this requirement by taking Ind. Ed. 181, or by taking four hours selected from Art. 170, 203, Home Econ. 196, or the equivalent.

[2] This requirement will be waived for students who have completed general zoology or an acceptable equivalent.

[3] Students who take D.G.S. 111 and 112 are not required to take Speech 101.

[4] D.G.S. 151 and 152 will be waived for students who have completed Sociol. 100 and one additional three-hour course in sociology.

[5] Speech 301 is a prerequisite or can be taken concurrently with Speech 385.

### Fourth Year

| | | | |
|---|---|---|---|
| Ed. 231—Technic of Teaching in the Elementary School | 3 | Ed. 220—Educational Practice in the Education of Exceptional Children | 5 |
| Ed. 232—Educational Practice in Elementary Education[1] | 5 | Ed. 323—Psychology and Education of the Mentally Handicapped | 3 |
| Ed. 322—Psychology and Education of the Mentally Handicapped | 3 | Electives[2] | 8 or 9 |
| S.W.A. 220—Introduction to Social Work | 3 | | |
| Electives[2] | 2 | | |
| *Total* | 16 | *Total* | 16 or 17 |

### Fifth Year

*For the Degree of Master of Science in the Education of Mentally Handicapped Children*

| Two of the following: | UNITS |
|---|---|
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 317—Exceptional Children | ½ |
| Ed. 322—Psychology and Education of the Mentally Handicapped | ½ |
| Ed. 323—Psychology and Education of the Mentally Handicapped | ½ |
| Ed. 426—Diagnostic and Remedial Programs of the School | 1 |
| Electives | 3½ |
| *Total* | 8 |

Electives should be chosen from the following (under special circumstances, other courses may be substituted with the approval of the adviser):

Ed. 390—Elements of Educational Statistics
Ed. 411—Psychology of Adolescence for Teachers
Ed. 412—Advanced Child Development for Students of Education
Ed. 417—Administration and Supervision of Education of Exceptional Children
Ed. 433—Curriculum Problems and Trends in Special Fields of Elementary Education
Psych. 338—Abnormal Psychology
Psych. 404—Advanced Physiological Psychology
Psych. 406—Quantitative Methods
Psych. 412—Advanced Child Psychology
Psych. 436—Personality
Psych. 471—Psychological Counseling and Psychotherapy
Psych. 493-494—Research Seminar
Speech 385—Speech Correction
Speech 388—Speech Correction

## Curriculum in Music Education

*For the Degree of Bachelor of Science in Music Education*
(See page 147)

[1] Educational practice will be with normal elementary children and with mentally retarded elementary children.

[2] Electives will be selected with the consent of the adviser. A maximum of forty hours in education will be allowed toward graduation.

## Curriculum in Physical Education for Men

*For the Degree of Bachelor of Science in Physical Education*
(See page 233)

## Curriculum in Physical Education for Women

*For the Degree of Bachelor of Science in Physical Education*
(See page 235)

## Certification of Teachers

The University's Office of Teacher Placement, in response to requests from school authorities, recommends qualified graduates of the University for positions as teachers and supervisors in public schools, colleges, and technical schools. Applicants should consult the head of teacher placement in 200 Gregory Hall.

Each applicant for a position in the schools of Illinois, on completing his work in the University, should have a transcript of his record sent by the Office of the Recorder to the State Superintendent of Public Instruction at Springfield. When he has obtained a position he should apply for a certificate through the office of the superintendent of schools in the county in which he is to teach. The requirements now in effect for the kinds of certificates most frequently needed by graduates of the University are as follows:

A limited high school certificate, valid for four years for teaching in grades seven to twelve of the common schools, may be issued to prospective teachers who have graduated with a bachelor's degree from a recognized college or who present certified evidence, accompanied by faculty recommendation, of having completed the requirements below. This certificate is renewable in periods of four years upon successful teaching and professional growth satisfactory to the county superintendent of schools.

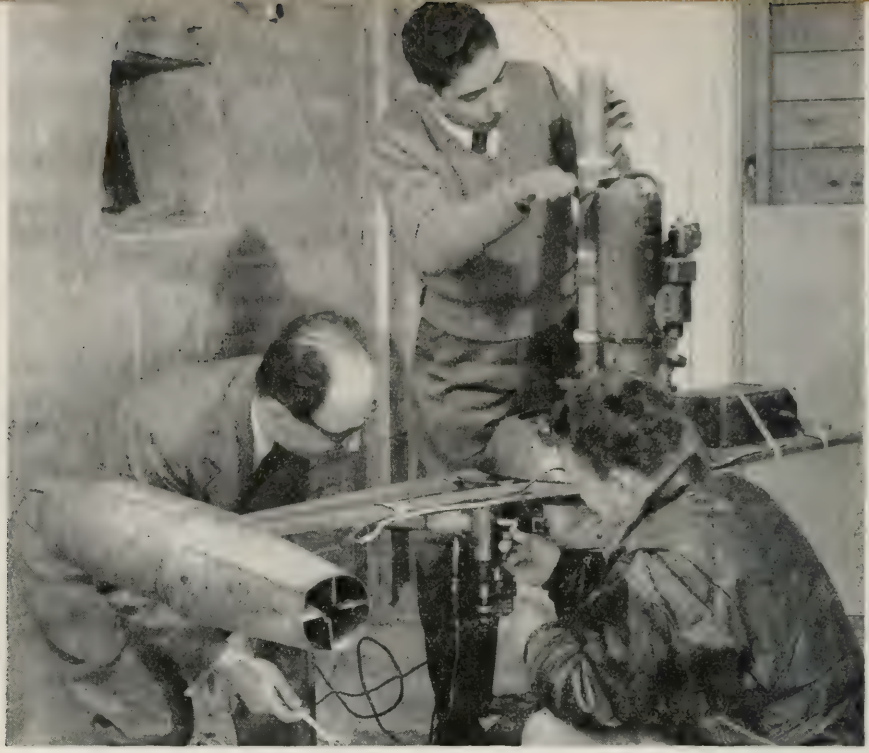
| | HOURS |
|---|---|
| I. General Education | 35 |
| (a) Oral and Written Expression | 8 |
| (b) Natural Science | 6 |
| (c) Social Science | 6 |
| (d) Humanities | 6 |
| (e) Health and Physical Education | 3 |
| (f) Additional work in any of the above fields | 6 |
| II. Education (Professional) | 16 |
| (a) Adolescent Growth and Development | 2 or 3 |
| (b) Principles or Philosophy of Education (including the study of professional ethics) | 2 or 3 |
| (c) Student Teaching (high school level) | 5 |
| (d) Materials and Methods in the Secondary School, or Methods of Teaching a Particular Secondary School Subject | 2 or 3 |
| (e) American Public Education | 2 or 3 |
| (f) Electives in Professional Education | |
| III. Electives | 21 |
| IV. One Major Area of Specialization | 32 |
| V. One Minor Area of Specialization | 16 |
| *Total* | 120 |

(Three minors, two of which are in related fields, will be accepted in lieu of one minor and one major.)

A life high school certificate, valid for teaching and supervising in grades seven to twelve of the common schools, may be granted to those fulfilling the following requirements: A master's degree conferred by a recognized college or university, credit for twenty-two semester hours in education, and four years of successful teaching experience, two of which must have been in the state of Illinois.

Statements of the requirements for other types of certificates may be found in the University of Illinois Bulletin, *If You Want to Be a Teacher.*

College of Engineering



Engineering Students Learning About Ram Jets, One of the Aids to Faster Air Travel

A Demonstration in the Illumination Laboratory

# College of Engineering

The College of Engineering aims to prepare men for professional work in engineering and for responsible positions of a technical and semitechnical character in industry, commerce, and government. The college provides training in the mathematical and physical sciences and their applications to the design, construction, and operation of industrial plants and public and private works of all kinds. The curricula, though widely varied and specialized, are built on a general foundation of scientific facts and theories applicable to many different fields. Work in the classrooms, laboratories, shops, and drafting rooms is correlated by practical problems which the students solve by methods similar to those of practicing engineers.

In addition to the fundamental and technological courses in each curriculum, some cultural courses are required in the humanities, such as history, economics, rhetoric, and speech, and others are elective, so that each student may broaden his program. Thus, training for the practice of engineering as a profession is supplemented by an understanding of human relationships, an appreciation of economic factors in industrial and public works enterprises, and an insight into regional and national problems of production and distribution of goods.

While each student pursues a curriculum of his own choice according to the field of his particular interest, all the students take certain courses in common. Basic courses in mathematics, chemistry, physics, rhetoric, and drawing are required in the first two years. Although the curricula are progressively specialized in the third and fourth years, each student is required to take some courses outside his main field.

Besides courses in the history and economics of industry, in transportation and public and private engineering works, in industrial relations, and in business law—which are essential to the engineer—numerous courses in accountancy, business organization and operation, liberal arts and sciences, theory and appreciation of architecture, art, and music, and the history, principles, and methods of education are available as nontechnical electives to be counted toward graduation.

The Engineering Library on the first and second floors of Civil Engineering Hall contains the reference books, periodicals, catalogs, and technical publications which the students need constantly, and also provides for general reading and private research.

Most of the departments in this college offer courses for graduate students as well as for undergraduates. Some of the undergraduate courses may be taken for credit in the Graduate College.

## Requirements for Graduation

Students in the College of Engineering who meet the University's general requirements with respect to registration, residence, and fees, and who maintain satisfactory scholastic records in this college, are awarded degrees appropriate to their curricula. Each curriculum requires a minimum of 136 semester hours of credit, not counting the required work in military training and physical education.

Each curriculum leads to the degree of Bachelor of Science and may ordinarily be completed in four years. A graduate of one curriculum ordinarily can qualify for another baccalaureate degree by doing a fifth year of work, consisting of thirty to thirty-six semester hours, acceptable to the faculty of this college, providing plans have been made looking toward such an arrangement at the beginning of his third year.

A graduate of the College of Liberal Arts and Sciences, or any other college of equal standing, who has adequate training in mathematics, physics, and mechanics to enable him to begin the third year of a curriculum in the College of Engineering, can usually qualify for the degree of Bachelor of Science from this college by two and one-half years of work.

The degree of Bachelor of Naval Science is provided for those students enrolled in the N.R.O.T.C. program as engineers, who wish to terminate their curricular work at the end of the eight semesters. Nine semesters are required to earn the Bachelor of Science degree with engineering designation in any curriculum in the college in this program.

## Special Requirements

**Foreign Language.** In any curriculum requiring French or German, a student who has been admitted to the University with credit for one or more years of secondary school work in either or both of these languages may count each unit of his entrance credit as equivalent to one semester of university work in excusing him from the required language. Only whole units may be so counted. In the place of the language requirement thus fulfilled, the student must take additional electives approved by the faculty of this college.

**Inspection Trips.** Seniors in the College of Engineering are required to make a trip for inspection of industrial establishments and engineering enterprises in the fields of their major interests. The students who are about to be graduated, and other students who obtain permission of the general committee in charge of this trip, travel in groups under the supervision of faculty members. The trip usually occupies from three to four days and involves an expense of approximately $20 to each student.

**Thesis.** A senior of high standing in any curriculum, with the approval of the department concerned, may substitute for one or more technical courses an investigation of a special subject and write a thesis on his results.

## Departments and Curricula

The College of Engineering includes the departments of Aeronautical Engineering, Ceramic Engineering, Civil Engineering, Electrical Engineering, General Engineering Drawing, Mechanical Engineering, Mining and Metallurgical Engineering, Physics, and Theoretical and Applied Mechanics. The undergraduate curricula described below are administered by these departments. The work in chemical engineering is administered by the College of Liberal Arts and Sciences. The curriculum in general engineering is administered by the dean of the college directly.

Courses in general engineering drawing are given for students in all curricula. This department has offices and drafting rooms in the Transportation Building.

Each student entering the College of Engineering declares his choice of a curriculum. Except where stated in the outline of a curriculum, all first-year students follow the common programs for freshmen shown on page 112.

At the beginning of any semester of the first two years, any student is free to change from one curriculum to another without loss of much, if any, credit for the work he has done. Students who are not far advanced in this college may transfer to other colleges without much loss of time in their progress toward degrees.

**Special Curricula.** Students of high scholastic achievement, with exceptional aptitudes and interests in special fields of engineering science and its application, may be permitted to vary the course content of the standard curriculum of the department in which they are registered, with the purpose of emphasizing some phases which are not included in the

standard curriculum or which can not be encompassed by the usual procedure of course substitution and selection of electives. These unwritten curricula, however, include all the fundamental courses of the standard curricula, the variations being made mainly in the so-called "applicatory" portions of the standard curricula of the college. The program of studies of each student permitted to take such a special curriculum must be approved by a committee of the college, of which the associate dean is chairman, in consultation with the head of the department in which the student is registered, and with a professor of the college particularly interested in the field which the student intends to emphasize. This professor automatically becomes the student's adviser in charge of registration and other matters pertaining to the approved program.

**Aeronautical Engineering.** The curriculum in aeronautical engineering is offered to train students in the basic principles of airframe and aircraft power plant design and construction. The course work provides sound training in fundamentals which may be applied to related engineering fields. Provisions for elective courses enable the student to pursue advanced undergraduate study in the fields of aerodynamics, aircraft structures, aircraft power plants, design, and production. Graduate study and research may also be undertaken in these divisions.

The aeronautical engineering laboratories are located on the campus and at the University Airport. These facilities include an aerodynamics laboratory equipped with wind tunnels and visual flow apparatus, an aircraft physical testing laboratory with equipment for static and dynamic testing of aircraft parts and assemblies, and an aircraft power plants laboratory in which facilities are provided for instruction and research on reciprocating and jet engines and rocket motors. Laboratories for work with aircraft instruments, aircraft hydraulic and electrical systems, and general accessories are also available.

**Agricultural Engineering.** The curriculum in agricultural engineering includes the same basic courses as other engineering curricula, and in addition fundamental agricultural courses are required. In the junior year the student chooses one of two options: (1) the machinery and power option which includes mechanical engineering design courses and advanced work in farm power and farm machinery design, and (2) the farm structures, soil and water conservation option which includes civil engineering design and agricultural engineering courses in farm structures and soil and water engineering. By combining College of Agriculture requirements in a five-year program, the student may obtain bachelor's degrees, both in engineering and agriculture. For this five-year program he should first register in the College of Agriculture.

**Ceramic Engineering.** The courses in the Department of Ceramic Engineering deal with the general scientific principles underlying a wide variety of industries in which the raw materials are largely non-metallic minerals, generally silicates. The ceramic industries include the manufacture of brick, tile, and other structural clay products; pottery articles of all types; fire brick and other refractories; glass; porcelain enamels; abrasives; cements; and other products.

Training in ceramic engineering prepares men for positions of responsibility in the investigation of the physical and chemical properties of raw materials and ceramic products; in the technical control and supervision of processing and manufacturing operations; in the design and erection of kilns, dryers, and other plant equipment; in research and development of new processes and products; and in engineering service in connection with the sale and uses of ceramic materials, products, and processing equipment. Some opportunity for specialization in a particular field of ceramics is provided in elective courses in the curriculum.

The Ceramics Building provides well-equipped laboratories for student instruction and for research, classrooms, offices, library, and museum displays. The adjoining Kiln Laboratory is equipped with a variety of kilns and furnaces for ceramic firing operations as well as machinery for the grinding of materials and for the production of structural clay products.

**Chemical Engineering.** The courses in chemical engineering, which are conducted by the Department of Chemistry in the College of Liberal Arts and Sciences, prepare students to evaluate results obtained in the laboratory and to translate them through a series of developmental stages into large-scale commercial processes; to improve existing plants; to develop new commercial products; to design new equipment; and to operate and supervise plants in which chemical processes take place. The curriculum offers a thorough

training in the fundamental sciences of chemistry, mathematics, and physics, and their application to industry in a wide variety of fields.

The chemical engineering laboratories are in the East Chemistry Building and in several smaller buildings constructed for special investigations. The equipment in these laboratories is extensive, and in addition other equipment of the Department of Chemistry is available for the use of students in the curriculum in chemical engineering.

**Civil Engineering.** The curriculum in civil engineering offers a systematic training in the principles underlying the design and construction of bridges, buildings, dams, retaining walls, foundations, and other structures; highways; water supply and sewage disposal systems; hydraulic engineering works, etc. Opportunity is offered in the fourth year for a certain amount of specialization in some of the more important branches of civil engineering by the construction, highway, hydraulic, railway, and structural options.

Civil Engineering Hall provides ample space for the departmental offices, classrooms, and the senior and junior drafting rooms. An individual desk, available at all times, is provided for each student. In the corridors of this building there is a comprehensive exhibit of large pictures illustrating outstanding civil engineering works.

The Surveying Building contains recitation and drafting rooms and instrument lockers. It is located close to the surveying practice fields.

The Arthur Newell Talbot Laboratory houses laboratories of the Departments of Civil Engineering and Theoretical and Applied Mechanics. The concrete laboratory is provided with the facilities necessary for the study of the proportioning and mixing of concrete and of its physical properties. The highway laboratories are equipped for tests on bituminous and non-bituminous highway materials. The structural laboratory has testing machines varying in capacity from thirty thousand pounds to three million pounds and all of the necessary instruments for making a complete study of the behavior of structural materials under stress. The subgrade soils laboratory has apparatus for making the routine physical tests as outlined by the United States Bureau of Public Roads. In all of these laboratories provision is made for research and graduate work as well as for undergraduate work.

The Sanitary Engineering Laboratory is equipped to conduct tests in the field of sanitary engineering, including water supply, distribution, and purification; sewerage and sewage treatment; and stream pollution. The University Water Works, the local works of the Illinois Water Service Co., and the sewage treatment works of the Urbana-Champaign Sanitary District provide opportunities for practice and study.

The Hydraulic Engineering Laboratory is equipped to carry on model research projects in drainage, open channel flow, pressure flow, orifice discharge, spillway discharge, and other features pertaining to the design and construction of hydraulic structures. A unique feature of the laboratory is a heated space 10 feet wide and 330 feet long equipped with a traveling crane for the handling of heavy equipment. This space is well adapted to studies relating to either open channel or pipe flow.

**Electrical Engineering.** The electrical engineering curriculum prepares men for responsible engineering positions in research, development, design, operation, sales, and administration in the fields of electrical power, communication and electronic engineering, and illumination.

Fundamental to the curriculum is basic work in mathematics and physics which is taken by the student during his first two and one-half years. Work in the Electrical Engineering Department begins in the second semester of the second year with a basic course in electric circuits and fields. This course must be satisfactorily completed before any of the third year work in the department may be undertaken.

During the third year the student is expected to make a choice as to which of the three sub-areas of the general electrical field he desires to emphasize. These three subareas are represented by the options in electrical power engineering, communication and electronic engineering, and illumination engineering. In each option technical courses and laboratory exercises are combined to provide a broad general training as well as to emphasize the fields of the options.

The Electrical Engineering Building has laboratories which are well equipped for the experimental solution of problems in all fields of electrical engineering. Provision is also made for graduate work in these laboratories. Facilities are available for research in most areas of electrical engineering including vacuum and gas tubes, antennas and fields, ultrasonics, power generation, and power transmission and distribution.

The Electrical Engineering Annex contains a laboratory for the study of high-voltage phenomena, the illumination laboratory, and the photometric laboratory. The illumination and photometric laboratories contain exceptionally complete equipment for the demonstration of illumination principles. A part of this laboratory contains complete equipment for colorimetry, making these laboratories outstanding in this field.

For students who show exceptional ability and interest and who present an integrated program of study, opportunities to do individual work, particularly of an investigational nature, are provided in both the third and fourth years. Although the options specify the requirements for a degree, these students may pursue a program, if approved, fitted to their particular needs.

**General Engineering.** The curriculum in general engineering is provided for those students who wish to combine a sound education in engineering principles and their application with substantial basic work in industrial organization and administration, supplemented by cultural and humanistic studies in selected areas. Optional arrangements in design and other sequences are shown in the curriculum statements on page 122.

**Mechanical Engineering.** The courses in the Department of Mechanical Engineering present the theory and practice of the generation, transmission, and utilization of power; and of the theory of operation, design, testing, and construction of machines of all kinds. In the laboratories emphasis is given to the engineering and economic principles of machine operation, performance, and construction, and to the problems of production management.

The first year of the curriculum in mechanical engineering is the same as in other branches of engineering. The second year is common to all optional curricula in mechanical engineering. During the third and fourth years a wide variety of optional course sequences is available which permits some emphasis in one of the following phases of the general field: heat power, machine design, production, research, air conditioning and refrigeration, petroleum production, and railway motive power. In addition to these special options there is provided a general option which permits the selection of electives cutting across several of the special options. Or the student may select courses in general education, the social sciences, literature, and the humanities to the extent of twenty-four semester hours within the framework of the general option. All optional curricula contain the same strong basic courses in science, mathematics, mechanics, and engineering fundamentals extending throughout the four years. Emphasis is on fundamentals even in the application subjects.

The laboratories of the department are well arranged and provided with modern equipment for graduate investigations and research as well as undergraduate instruction. Detailed description of the laboratory facilities is not possible in the space allotment here. However, a brief listing of the laboratories will indicate the breadth of the available facilities. The following laboratories are located in the Mechanical Engineering Building, the Mechanical Engineering Laboratory Building, and in the Foundry Building: power laboratory, physical environment laboratory, internal combustion engine and turbine laboratory, machine tool laboratory, metal cutting laboratory, welding laboratory, foundry laboratory, sand testing laboratory, heat treatment of metals laboratory, machine design laboratory, motion and time study laboratory, instrumentation and controls laboratory, heat transfer and combustion laboratory, thermodynamics laboratory, fuels and lubricants laboratory, gage calibration laboratory, and the pattern laboratory. In addition, three research residences are owned, maintained, and operated by cooperating organizations for research in the general field of heating and ventilating. Several of these laboratories contain special machines and equipment which make them outstanding in their respective fields.

**Mining and Metallurgical Engineering.** The Department of Mining and Metallurgical Engineering offers two curricula, as follows:

**Metallurgical Engineering.** Metallurgy may be divided into three main divisions—chemical, mechanical, and physical. Chemical metallurgy includes the metallurgical processes involving chemical change and embraces methods of production and refining of metals from their ores. Mechanical metallurgy includes all the processes of working and shaping metals and alloys—processes which do not involve chemical changes but adapt metals as to size and form, such as rolling, forging, drawing, spinning, casting, etc. Physical metallurgy deals with the nature, structure, physical, and mechanical properties of

metals and alloys. It includes metallography, testing of metals and alloys, heat treatment of metals and alloys and the physical changes produced thereby. The curriculum in metallurgical engineering has been designed to include the engineering fundamentals of these three main divisions, but emphasis is placed upon physical metallurgy. Specialized courses are provided for ferrous and non-ferrous process metallurgy, physical metallurgy, ferrous and non-ferrous metallography, physics of metals, electrometallurgy, heat treatment, fuels and furnaces, alloy steels, and mechanical metallurgy.

**Mining Engineering.** The curriculum in mining engineering is designed for student instruction in the fundamental engineering problems dealing with the extraction of coal and minerals from the earth, and the preliminary preparation of these substances for use in our modern civilization. To the preliminary courses in mathematics, physics, chemistry, general engineering drawing, and mechanics, common to all curricula in engineering, the department adds specialized courses in mine surveying, mining methods, prospecting, mine examination, mine ventilation, coal preparation, mineral dressing, mine administration, and design of mine plants. Interwoven with the departmental program is a series of required courses which provides a broad engineering background for the student. The inclusion of elective courses in the curriculum offers flexibility in caring for the needs of the individual students.

**Physics.** The Department of Physics offers a curriculum in engineering physics, designed to give students the broad and thorough training in fundamental physics and mathematics which is demanded by the increasing complexity of modern engineering practice. The work of the first two years is much like that in the other engineering curricula; in the last two years advanced courses in physics, mathematics, and chemistry are emphasized, but there is a liberal allowance of electives which the student may use to study the field of engineering in which he is especially interested. The details of technical applications are left to be learned in connection with a particular job; or, if the electives are properly selected, the engineering physics curriculum may be made a basis for graduate work in some particular field of engineering or in physics.

The Physics Laboratory has complete facilities for instruction and investigation in physics, and is especially well equipped for investigations in spectroscopy, high vacua, acoustics, magnetism, magnetic and electrical measurements, electronics, optics, and nuclear physics. Gas, direct and alternating current at several voltages, distilled water, compressed air, and liquid air are freely available. There are two well-equipped workshops, one for the mechanicians of the department and one for instructors and advanced students. Nearly all research equipment of a specialized nature is constructed here. A glass blower is in charge of a glass-blowing shop where a large variety of glass equipment is made. An excellent library of periodicals and books of special use in connection with the courses in physics is maintained in the Physics Laboratory.

A large cyclotron which yields 12 M.E.V. deuterons is housed in the Nuclear Radiations Laboratory and, with other experimental apparatus available there, is used by graduate students and faculty for experimental work in nuclear physics.

The betatron research and development program is housed in the well-equipped Physics Research Laboratory. Faculty and graduate students are engaged in the study of nuclear phenomena produced by X-rays and electrons from the unique 340 M.E.V. betatron and the smaller 80 M.E.V. and 22 M.E.V. betatrons.

The laboratory for the physics of solids has a cryostat for the production of liquid helium and a variety of apparatus for the study of metals, semiconductors, and other solids.

**Railway Engineering.** To prepare students for service in the technical departments of railways, options are offered in railway civil engineering and railway mechanical engineering, both of which are substantially the same as the civil and mechanical engineering curricula up to the end of the third year. The option in railway civil engineering is prepared for those who plan to enter the engineering department of steam and electric railways, while the option in railway mechanical engineering is designed for those who wish to enter the motive-power department of steam railways. The special subjects in railway civil engineering concern the location, design, construction, and maintenance of track and equipment, and the design of railway structures. The courses in railway mechanical engineering add to the fundamentals of the general mechanical engineering curriculum special courses on the design of locomotives and cars, the resistance of trains, the performance and tests of locomotives, and tests of railway equipment. The University owns and operates, jointly with the Illinois Central Railroad, a railway test car designed

for experimental work on steam roads. It is equipped for making train resistance and locomotive performance tests.

**Sanitary Engineering.** The curriculum in sanitary engineering parallels closely that in civil engineering, putting greater emphasis on the engineering problems involved in the control of the environment to protect and improve health and comfort. The curriculum is administered by the Department of Civil Engineering and leads to the degree of Bachelor of Science in Sanitary Engineering.

**Theoretical and Applied Mechanics.** The Department of Theoretical and Applied Mechanics offers courses in the mechanics of rigid and deformable bodies and of incompressible fluids. Nearly all of the undergraduate curricula in engineering require courses in statics and dynamics of rigid bodies, in strength of elastic and of inelastic materials, and in hydraulics and fluid mechanics. In addition, the department offers graduate programs of study and research leading to the degrees of Master of Science and Doctor of Philosophy, in which basic theoretical physical laws, mathematics, and experimental investigations are emphasized.

The laboratories of the Department of Theoretical and Applied Mechanics, except the car wheel laboratory, are housed in the Arthur Newell Talbot Laboratory, which also contains some of the laboratories of the Civil Engineering Department. In laboratory courses in theoretical and applied mechanics, both on the undergraduate and the graduate levels, the student is an active participant in the use of the extensive equipment and delicate instruments available for the experimental work. An indication of the types of work conducted in the various laboratories is given as follows:

In the materials laboratory the student makes use of various types of testing machines for determining the load-resisting properties of materials required in the design, construction, and operation of engineering machines and structures and for observing the strain behavior of members subjected to various types of loads. For research and advanced instruction in the behavior of large machine parts and structural members, testing machines with capacities as large as 600,000 and 3,000,000 pounds are available together with a wide selection of precise mechanical and electrical instruments for observing the detailed strain behavior of the member.

The concrete research laboratory has facilities for the making, curing, and testing of concrete and reinforced concrete members under repeated and impact loading as well as static loading.

The fatigue of metals laboratory contains many machines of various types for the study of the behavior of materials under repeated loading and under particular environmental conditions involving corrosion, high and low temperatures, etc. Facilities for the study of the creep and relaxation of materials are also available as a part of the general study of the effect of time and temperature on the behavior of materials with special reference to fatigue and elevated temperature service. This study involves the use of a knowledge of the internal crystalline structure of metals.

The photoelasticity laboratory is equipped for the analysis of stresses in bodies of irregular or complicated form for which mathematical methods of analysis of stresses are inadequate, and instrumentation is available for other methods of experimental stress analysis involving optical and electrical as well as mechanical methods. The vibration laboratory employs various models and instruments such as vibration excitors, oscillographs, etc., for the study and analysis of vibrations in machine parts and structural members. The plastics laboratory, in which constant temperature and humidity are maintained, is equipped with a wide range of modern apparatus for the study of the load-resisting properties of plastics and plastic laminates.

The railroad rail and car wheel laboratories, the latter housed in a separate building, are available for carrying on research and advanced instruction on a number of problems involved in railway engineering.

The hydraulics and fluid mechanics laboratory contains equipment for the study of the flow of water in open channels, in pumps and turbines, and in various pipe systems. The flow of air and of oil are also studied in several experiments. Some of the more important special equipment consists of several types of viscometers, transparent walled tilting flumes and a two-dimensional water tunnel. Facilities for research and graduate study are available in both open channel flow and closed conduit flow in maximum quantities of approximately 40 cu.ft/sec.

### Electives and Options

Non-technical electives for students in the College of Engineering include all courses offered in the College of Liberal Arts and Sciences and in the College of Commerce and Business Administration; the general courses in the College of Education; courses numbered 100 through 122 in the School of Music; Art 111, 112, and 115; L.A. 111; and the seven courses in Engineering numbered 140, 141, 216, 220, 230, 239, and 292. Field survey courses may be used in place of the non-technical and approved electives in any curriculum, with some reduction in credit. Students electing the third and fourth years of military training and those taking naval science courses may count the credit they receive in place of approved and non-technical electives to an amount equal to the total of these electives stated in each curriculum.

Technical electives include all courses in the College of Engineering not required in the student's curriculum, excepting G.E.D. 101, 102, 104, 106, 107, and 108, and Eng. 140, 141, 216, 220, 230, 239, and 292.

Approved electives include all technical and non-technical electives as defined above and other courses designated as approved electives in the outlines of curricula.

Departmental electives and technical options are restricted to courses of a technical character as listed under this classification by each department.

Options are groups of related courses in a special field of subject matter.

## Common Programs for Freshmen

Freshmen in the College of Engineering take this program unless otherwise specified in the curricula outlined on the following pages.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 102 or 103—General Chemistry | 3 or 4 | Chem. 104—Chemistry of the Metallic Elements | 4 |
| G.E.D. 101—Elements of Drawing, or G.E.D. 104—Advanced Drawing | 4 | G.E.D. 102—Descriptive Geometry | 4 |
| Math. 112—College Algebra | 3 | Math. 122—Analytic Geometry | 4 |
| Math. 114 or 115—Plane or Advanced Trigonometry | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Hygiene 101—Health Lectures | 2 |
| Eng. 100—Engineering Lectures | 0 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | | |
| *Total* | 17 or 18 | *Total* | 19 |

### N.R.O.T.C. Students in Engineering

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| G.E.D. 101—Elements of Drawing or G.E.D. 104—Advanced Drawing | 4 | Chem 102 or 103—General Chemistry | 3 or 4 |
| Math. 112—College Algebra | 3 | Math. 122—Analytic Geometry | 4 |
| Math. 114 or 115—Plane or Advanced Trigonometry | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Hygiene 101—Health Lectures | 2 |
| N.S. 100—Ordnance and Communication | 0 | N.S. 100—Ordnance and Communication | 0 |
| N.S. 111—Naval Orientation | 3 | N.S. 112—History of Sea Power | 3 |
| Eng. 100—Engineering Lectures | 0 | Physical Education | 1 |
| Physical Education | 1 | | |
| *Total* | 16 | *Total* | 16 or 17 |

It takes nine semesters to complete the requirements for a Bachelor of Science degree in any curriculum of the college in the N.R.O.T.C. program. The first two semesters are common to all curricula as stated above. The other seven are completely worked out and

are on file in the college office and in each department offering a curriculum in the program.

## Curriculum in Aeronautical Engineering

*For the Degree of Bachelor of Science in Aeronautical Engineering*

### First Year

Common Program for Freshmen (page 112)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| G.E.D. 103—Aircraft Drafting and Lofting | 3 | Math. 142—Calculus | 3 |
| Math. 132—Calculus | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| M.E. 182—Manufacturing Processes | 3 | T.A.M. 156—Analytical Mechanics (Statics and Dynamics) | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Non-technical Electives[1] | 3 |
| *Total* | 18 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| Aero. E. 201—Aircraft Materials and Processes | 3 | Aero. E. 212—Introduction to Aerodynamics of Real Fluids | 3 |
| Aero. E. 211—Aerodynamics | 3 | Aero. E. 220—Aircraft Structures | 3 |
| Math. 345—Differential Equations and Orthogonal Functions[2] | 3 | E.E. 202—Direct and Alternating Current Circuits and Machines | 2 |
| M.E. 205—Thermodynamics | 3 | E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 |
| T.A.M. 221—Resistance of Materials | 3 | M.E. 222—Mechanics of Machinery | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | Approved Electives | 6 |
| Non-technical Electives[3] | 3 | | |
| *Total* | 19 | *Total* | 18 |

### Fourth Year

| | | | |
|---|---|---|---|
| Aero. E. 221—Aircraft Structures | 3 | Aero. E. 242—Airplane Design | 3 |
| Aero. E. 231—Aircraft Power Plants | 3 | Aero. E. 264—Aircraft Structures Laboratory | 2 |
| Aero. E. 241—Airplane Design | 3 | Aero. E. 262—Aircraft Engine Laboratory | 2 |
| Aero. E. 261—Aerodynamics Laboratory | 2 | Aero. E. 290—Seminar | 1 |
| Aero. E. 299—Inspection Trip[4] | 0 | Eng. 292—Engineering Law | 3 |
| E.E. 217—Electrical Measurement | 3 | Approved Electives | 6 |
| Approved Electives | 3 | | |
| *Total* | 17 | *Total* | 17 |

## Curriculum in Agricultural Engineering

*For the Degree of Bachelor of Science in Agricultural Engineering*

### First Year

Common Program for Freshmen (page 112)

[1] Speech 101 or Eng. 216 recommended.
[2] Math. 341 may be substituted.
[3] Econ. 108 recommended.
[4] Not required during 1951-1952.

## Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Agr. Eng. 111—Farm Structures and Soil and Water Conservation | 3 | Agr. Eng. 112—Tractors and Field Machinery | 3 |
| Bot. 100—General Botany | 4 | Agron. 121—Crop Production | 4 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 19 | *Total* | 19 |

## Third Year

### Machinery and Power Option

| | | | |
|---|---|---|---|
| Econ. 108—Elements of Economics | 3 | Agr. Econ. 120—Farm Management | 3 |
| Geol. 105—Agricultural Geology | 3 | Agron. 201—Soils | 5 |
| M.E. 221—Mechanics of Machinery | 5 | M.E. 183—Materials Casting | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | M.E. 202—Thermodynamics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | M.E. 224—Design of Machine Elements | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | | |
| *Total* | 18 | *Total* | 17 |

### Farm Structures, Soil and Water Conservation Option

| | | | |
|---|---|---|---|
| C.E. 115—General Surveying | 3 | Agr. Econ. 120—Farm Management | 3 |
| C.E. 235—Plain Concrete | 2 | Agr. Eng. 262—Farmstead and Home Equipment | 3 |
| Econ. 108—Elements of Economics | 3 | Agron. 201—Soils | 5 |
| Geol. 105—Agricultural Geology | 3 | C.E. 261—Structural Analysis | 4 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | | |
| *Total* | 18 | *Total* | 19 |

## Fourth Year

### Machinery and Power Option

| | | | |
|---|---|---|---|
| Agr. Eng. 299—Inspection Trip | 0 | Agr. Eng. 332—Design of Agricultural Machinery | 3 |
| Agr. Eng. 341—Farm Power | 3 | Agr. Eng. 393—Special Problems | 3 |
| E.E. 306—Direct and Alternating Current Circuits | 3 | E.E. 308—Direct and Alternating Current Apparatus | 3 |
| E.E. 307—Direct and Alternating Current Laboratory | 1 | E.E. 309—Direct and Alternating Current Laboratory | 1 |
| M.E. 184—Metal Processing | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| M.E. 271—Design of Machine Elements | 3 | Approved Electives | 4 |
| Approved Electives | 4 | | |
| *Total* | 17 | *Total* | 17 |

FARM STRUCTURES, SOIL AND WATER CONSERVATION OPTION

| | | | |
|---|---|---|---|
| Agr. Eng. 351—Hydraulics of Soil and Water Conservation | 3 | Agr. Eng. 393—Special Problems | 3 |
| Agr. Eng. 371—Advanced Farm Structures | 3 | C.E. 264—Structural Design | 5 |
| Agr. Eng. 299—Inspection Trip | 0 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 262—Structural Analysis | 3 | Approved Electives | 5 |
| C.E. 263—Elementary Structural Design | 2 | | |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 | | |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 | | |
| Approved Electives | 3 | | |
| *Total* | 17 | *Total* | 15 |

## Curriculum in Ceramic Engineering

*For the Degree of Bachelor of Science in Ceramic Engineering*

### First Year

Common Program for Freshmen (page 112), except that Chem. 105 and Math. 117 and 127 are substituted for Chem. 104 and Math. 112, 114, and 122.

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Cer. E. 101—Introduction to Ceramic Engineering | 3 | Cer. E. 102—Ceramic Processes and Equipment | 3 |
| Chem. 123—Quantitative Analysis | 5 | Geol. 130—Mineralogy for Engineers | 3 |
| Math. 137—Calculus | 3 | Math. 147—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 18 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| Cer. E. 201—Ceramic Technology | 5 | Cer. E. 202—Ceramic Technology | 5 |
| Cer. E. 203—Principles of Drying | 3 | Cer. E. 204—Kilns, Furnaces, and Firing Operations | 3 |
| Chem. 245—Elementary Physical Chemistry | 3 | Cer. E. 221—Pyrometry | 2 |
| T.A.M. 221—Resistance of Materials | 3 | Technical Electives | 4 or 5 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | Approved Electives | 3 |
| Approved Electives | 3 | | |
| *Total* | 18 | *Total* | 17 or 18 |

### Fourth Year

| | | | |
|---|---|---|---|
| Cer. E. 211—Ceramic Bodies and Glazes | 5 | Cer. E. 218—Refractories | 3 |
| Cer. E. 271—Ceramic Engineering Design | 2 | Cer. E. 272—Ceramic Engineering Design | 3 |
| Cer. E. 299—Inspection Trip | 0 | E.E. 204—Application of Electrical Equipment | 2 |
| C.E. 260—Structural Engineering | 3 | E.E. 205—Electrical Equipment Laboratory | 1 |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 | Technical Electives | 5 or 4 |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 | Approved Electives | 3 |
| Technical Electives | 2 | | |
| Approved Electives | 3 | | |
| *Total* | 18 | *Total* | 17 or 16 |

## Curriculum in Chemical Engineering

*For the Degree of Bachelor of Science in Chemical Engineering*

This curriculum is administered by the College of Liberal Arts and Sciences.
(See page 185)

## Curriculum in Civil Engineering

*For the Degree of Bachelor of Science in Civil Engineering*

### First Year

Common Program for Freshmen (page 112)

C.E. 101, three hours, and C.E. 102, four hours, are required courses which will be taught at the Summer Surveying Camp following the first year.

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| C.E. 103—Route Surveying | 3 | Econ. 108—Elements of Economics, or Speech 101—Principles of Effective Speaking[1] | 3 |
| C.E. 160—Building Construction and Materials | 3 | Geol. 150—Geology for Engineers[1] | 3 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 18 | *Total* | 18 |

NOTE: Transfer students who have completed two years of work and who have not had any surveying should take C.E. 111, 112, and 203. Special programs can be arranged for these students and others who have not had C.E. 160 or T.A.M. 150, so that they can graduate in two years in certain options, provided they present an equivalent amount of appropriate credit.

[1] Eight hours of credit in foreign language (French, German, or Spanish) may be substituted for Geol. 150 (3 hours), Econ. 108 or Speech 101 (3 hours), and approved electives (2 hours).

## Third Year

| | | | |
|---|---|---|---|
| C.E. 230—Soils and Bituminous Materials | 2 | C.E. 220—Highways | 3 |
| C.E. 235—Plain Concrete | 2 | C.E. 262—Structural Analysis | 3 |
| C.E. 261—Structural Analysis | 4 | C.E. 263—Elementary Structural Design | 2 |
| M.E. 201—Mechanical Power Equipment | 3 | E.E. 202—Direct and Alternating Current Circuits and Machines, or Approved Electives[1] | 2 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | E.E. 203—Direct and Alternating Circuits and Machines Laboratory, or Approved Electives[1] | 1 |
| T.A.M. 221—Resistance of Materials | 3 | T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| | | Approved Electives[2] | 2 |
| *Total* | 18 | *Total* | 17 |

## Fourth Year

### General Option

| | | | |
|---|---|---|---|
| C.E. 240—Water Supply | 4 | C.E. 241—Sewerage | 3 |
| C.E. 264—Structural Design | 5 | C.E. 270—Foundations and Retaining Walls | 3 |
| C.E. 290—Contracts and Specifications | 2 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Technical Electives | 5 |
| C.E. 299—Inspection Trip | 0 | Approved Electives | 4 |
| Technical Electives | 3 | | |
| *Total* | 14 | *Total* | 15 |

### Construction Option

| | | | |
|---|---|---|---|
| C.E. 237—Estimates and Costs | 2 | C.E. 239—Construction Planning and Management | 4 |
| C.E. 238—Construction Equipment and Methods | 3 | C.E. 270—Foundations and Retaining Walls | 3 |
| C.E. 248—Water Supply and Sewerage | 4 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 264—Structural Design | 5 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Eng. 230—Labor Relations | 3 |
| C.E. 299—Inspection Trip | 0 | Approved Electives | 3 |
| *Total* | 14 | *Total* | 15 |

### Highway Option

| | | | |
|---|---|---|---|
| C.E. 222—Highway and Municipal Design | 4 | C.E. 223—Traffic Engineering | 3 |
| C.E. 227—Terminals | 2 | C.E. 332—Engineering Properties of Soils | 2 |
| C.E. 231—Advanced Highway Materials | 2 | C.E. 264—Structural Design | 5 |
| C.E. 248—Water Supply and Sewerage | 4 | C.E. 270—Foundations and Retaining Walls | 3 |
| C.E. 290—Contracts and Specifications | 2 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Approved Electives | 2 |
| C.E. 299—Inspection Trip | 0 | | |
| *Total* | 14 | *Total* | 15 |

[1] Students expecting to obtain their degree in sanitary engineering should replace these with Chem. 122.

[2] Eight hours of credit in foreign language (French, German, or Spanish) may be substituted for Geol. 150 (3 hours), Econ. 108 or Speech 101 (3 hours), and approved electives (2 hours).

HYDRAULIC OPTION

| | | | |
|---|---|---|---|
| C.E. 250—Hydrology | 3 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 252—Water Resources, Planning and Development | 3 | C.E. 255—Water Power Engineering | 3 |
| C.E. 264—Structural Design | 5 | C.E. 271—Earth and Masonry Structures | 2 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 295—Professional Practice | 0 | C.E. 293—Special Problems, or Approved Electives | 1 |
| C.E. 299—Inspection Trip | 0 | C.E. 296—Professional Practice | 0 |
| | | C.E. 351—Drainage and Flood Control | 3 |
| *Total* | 14 | *Total* | 15 |

RAILWAY OPTION

| | | | |
|---|---|---|---|
| C.E. 226—Railway Location and Operation | 3 | C.E. 225—Railway Construction and Maintenance | 3 |
| C.E. 227—Terminals | 2 | C.E. 229—Signals | 2 |
| C.E. 264—Structural Design | 5 | C.E. 332—Engineering Properties of Soils | 2 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 290—Contracts and Specifications | 2 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Econ. 384—Economics of Transportation, or C.E. 238—Construction Equipment and Methods | 3 |
| C.E. 299—Inspection Trip | 0 | | |
| *Total* | 15 | *Total* | 14 |

STRUCTURAL OPTION

| | | | |
|---|---|---|---|
| C.E. 264—Structural Design | 5 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 265—Structural Design | 4 |
| C.E. 295—Professional Practice | 0 | C.E. 271—Earth and Masonry Structures | 2 |
| C.E. 299—Inspection Trip | 0 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 361—Statically Indeterminate Structures | 3 | C.E. 296—Professional Practice | 0 |
| Approved Electives | 3 | C.E. 361—Statically Indeterminate Structures | 3 |
| *Total* | 14 | *Total* | 15 |

## Curriculum in Electrical Engineering

*For the Degree of Bachelor of Science in Electrical Engineering*

### First Year

Common Program for Freshmen (see page 112)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Econ. 108—Elements of Economics | 3 | E.E. 126—Electric Circuits and Fields | 4 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light and Modern Physics) | 5 |
| Speech 101—Principles of Effective Speaking | 3 | T.A.M. 154—Analytical Mechanics (Statics and Dynamics) | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 18 | *Total* | 18 |

## Third Year

### Power Engineering and Communication Engineering Options

| | | | |
|---|---|---|---|
| Econ. 248—Personnel Administration[1] | 3 | E.E. 288—Economic Aspects of Engineering | 3 |
| E.E. 320—Circuit Analysis | 4 | E.E. 322—Circuit Analysis | 4 |
| E.E. 321—Circuit Laboratory | 1 | E.E. 323—Circuit Laboratory | 1 |
| Math. 345—Differential Equations and Orthogonal Functions | 3 | E.E. 334—Electrical Power Apparatus, and E.E. 335—Electrical Power Apparatus Laboratory,[2] or E.E. 351—Networks and Lines[3] | 4 |
| M.E. 202—Thermodynamics | 3 | E.E. 340—Electronics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | E.E. 341—Electronics Laboratory | 1 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | Non-technical Electives[1, 4] | 3 |
| *Total* | 18 | *Total* | 19 |

### Illumination Engineering Option

| | | | |
|---|---|---|---|
| E.E. 260—Fundamentals of Illumination | 3 | Arch. 217—Architecture and Civilization of the Americas to 1870[5] | 2 |
| E.E. 320—Circuit Analysis | 4 | E.E. 322—Circuit Analysis | 4 |
| E.E. 321—Circuit Laboratory | 1 | E.E. 323—Circuit Laboratory | 1 |
| Math. 345—Differential Equations and Orthogonal Functions | 3 | E.E. 340—Electronics | 3 |
| Psych. 100—Introduction to Psychology[5] | 4 | E.E. 341—Electronics Laboratory | 1 |
| T.A.M. 221—Resistance of Materials | 3 | E.E. 361—Elements of Illuminating Engineering Design | 4 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | Physiol. 101—Mammalian Physiology[5] | 3 |
| *Total* | 19 | *Total* | 18 |

## Fourth Year

### Power Engineering Option

| | | | |
|---|---|---|---|
| E.E. 268—Fundamentals of Illumination Engineering | 2 | E.E. 292—Seminar | 1 |
| E.E. 290—Seminar | 0 | E.E. 338—Electrical Power Apparatus | 3 |
| E.E. 336—Electrical Power Apparatus | 4 | E.E. 339—Electrical Power Apparatus Laboratory | 1 |
| E.E. 337—Electrical Power Apparatus Laboratory | 2 | M.E. 203—Power Plant Equipment | 3 |
| E.E. 347—Industrial Electronics | 4 | Technical Electives[4] | 5 |
| E.E. 378—Fundamentals of Power Transmission Engineering | 3 | Non-technical Electives[4,5] | 3 |
| Non-technical Electives[4,5] | 3 | | |
| E.E. 299—Inspection Trip | 0 | | |
| *Total* | 18 | *Total* | 16 |

[1] These courses will be waived for students in advanced military.
[2] E.E. 334 and 335 to be omitted by students in the communication engineering option.
[3] E.E. 351 to be omitted by students in the power engineering option.
[4] All electives to be chosen from lists approved by the head of the department.
[5] These courses will be waived for students in advanced military. Where additional hours are needed approved electives will be added.

COMMUNICATION ENGINEERING OPTION

| | | | |
|---|---|---|---|
| E.E. 290—Seminar | 0 | E.E. 292—Seminar | |
| E.E. 330—Electrical Machinery | 3 | E.E. 332—Electrical Machinery | 3 |
| E.E. 331—Electrical Machinery Laboratory | 1 | E.E. 333—Electrical Machinery Laboratory | 1 |
| E.E. 349—Electron Tube Circuits | 5 | E.E. 355—Fields and Waves | 4 |
| E.E. 353—Radio Circuits | 4 | Technical Electives[1] | 3 |
| Technical Electives[1] | 3 | Non-technical Electives[1, 2] | 6 |
| E.E. 299—Inspection Trip | 0 | | |
| *Total* | 16 | *Total* | 18 |

ILLUMINATION ENGINEERING OPTION

| | | | |
|---|---|---|---|
| Arch. 218—Architecture and Civilization of the Americas and Europe since 1870[2] | 2 | E.E. 292—Seminar | 1 |
| E.E. 290—Seminar | 0 | E.E. 332—Electrical Machinery | 3 |
| E.E. 330—Electrical Machinery | 3 | E.E. 333—Electrical Machinery Laboratory | 1 |
| E.E. 331—Electrical Machinery Laboratory | 1 | E.E. 364—Illumination Design and Economics | 4 |
| E.E. 347—Industrial Electronics | 4 | E.E. 365—Illumination Design Laboratory | 1 |
| E.E. 362—Principles of Illuminating Engineering | 4 | E.E. 366—Illumination Sources | 4 |
| E.E. 363—Illumination and Photometry Laboratory | 1 | Mktg. 373—Sales Management[2] | 2 |
| Mktg. 272—Industrial Selling | 3 | | |
| E.E. 299—Inspection Trip | 0 | | |
| *Total* | 18 | *Total* | 16 |

## Curriculum in Engineering Physics

*For the Degree of Bachelor of Science in Engineering Physics*

The purpose of this curriculum is to prepare students for investigations in engineering problems calling for a knowledge of physics and mathematics or chemistry, and for positions in certain industries which prefer men with a thorough education in basic science.

Students in the engineering physics curriculum, when registering for advanced undergraduate courses in physics at any stage in that curriculum, must have a grade average of at least 3.5 in all subjects, exclusive of the basic courses in military training and physical education, and a combined grade average of at least 3.5 in all subjects in mathematics and physics taken prior to such registration. Transfer students must have a corresponding record in the institution from which they transfer, and must maintain such status at the University.

### First Year

Common Program for Freshmen (page 112), except that substitution of Chem. 106 for Chem. 104 is advised.

[1] All electives to be chosen from lists approved by the head of department.

[2] These courses will be waived for students in advanced military. Where additional hours are needed approved electives will be added.

## Second Year[1]

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| German, or Approved Elective | 4 | German, or Approved Elective | 4 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| Approved Electives | 3 | Military (men) | 1 |
| | | Approved Electives | 3 |
| *Total* | 19 | *Total* | 19 |

## Third Year[1]

| | | | |
|---|---|---|---|
| E.E. 320—Circuit Analysis | 4 | Math. 345—Differential Equations and Orthogonal Functions[2] | 3 |
| E.E. 321—Circuit Laboratory | 1 | Physics 322—Theoretical Mechanics | 3 |
| Math. 343—Advanced Calculus[2] | 3 | Physics 342—Electricity and Magnetism | 3 |
| Physics 281—Intermediate Atomic Physics | 3 | Physics 343—Vacuum Tube Circuits[3] | 4 |
| Physics 321—Theoretical Mechanics | 3 | Physics 360—Heat, or M.E. 205—Thermodynamics | 3 |
| Physics 341—Electricity and Magnetism | 3 | Approved Electives | 3 |
| *Total* | 17 | *Total* | 19 |

## Fourth Year[1]

| | | | |
|---|---|---|---|
| Physics 344—Vacuum Tube Circuits,[3] or Technical Option[4] | 4 | Chem. 240—Elementary Physical Chemistry | 3 |
| Physics 371—Light | 2 | Physics 372—Light | 2 |
| Physics 373—Light Laboratory | 2 | Physics 374—Light Laboratory | 2 |
| Technical Option[4] | 3 | Approved Electives | 6 |
| Approved Electives | 6 | Technical Option[4] | 3 |
| *Total* | 17 | *Total* | 16 |

[1] The election of Chem. 110, 124, and 234 is advised. Students wishing to emphasize chemistry may substitute chemistry electives for E.E. 320 and 321. Students wishing to emphasize electrical engineering should elect E.E. 350 and 351, 352 and 353, and 354 and 355 in their fourth year. Students wishing to emphasize geophysics should elect most or all of their technical options in geology. Five hours must be approved non-technical courses.

[2] Math. 341 and 342, or Math. 347 and 348 may be substituted for Math. 343 and 345.

[3] Students desiring to emphasize electrical engineering may elect, if they so desire, E.E. 342 and 343 and E.E. 344 and 345 instead of Physics 343 and 344. These students should register in E.E. 350 and 351 concurrently with E.E. 342 and 343, or Physics 343; E.E. 344 and 345, or Physics 344 may be taken concurrently with E.E. 352 and 353. This allows E.E. 354 and 355 to be taken the second semester of the fourth year.

[4] Technical options: Chem. 110, 124, 234, 241, 336, 337, 342, 343, 344, 397, 398; E.E. 330 and 331, 344 and 345, 350 and 351, 352 and 353, 354 and 355; Geol. 102, 150, 246; Math. 161, 317 and 318, 327 and 328, 347 and 348, 361, 385, 387, 388; M.E. 184, 371, 372; any courses in physics or astronomy; T.A.M. 211, 221, 223.

## Curriculum in General Engineering

*For the Degree of Bachelor of Science in General Engineering*

This curriculum is intended for students who do not wish to pursue the more specialized engineering curricula, but who wish to secure a sound education in engineering principles and their application. Fifteen hours of work in economics, engineering law, industrial relations, etc., are required, and eight to fourteen hours of free electives are allowed. The mechanical engineering design sequence of courses, namely, M.E. 221, 224, and 271, plus six hours of approved electives will be accepted in place of C.E. 261, 262, 263, 264, and Geol. 150 in the third and fourth years. A sales engineering option can be readily planned within the elective framework of the curriculum.

### First Year

Common Program for Freshmen (page 112)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Econ. 108—Elements of Economics | 3 | C.E. 115—General Surveying, or M.E. 183—Materials Casting | 3 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| M.E. 183—Materials Casting, or C.E. 115—General Surveying | 3 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 18 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| Accy. 201—Fundamentals of Accounting | 3 | C.E. 261—Structural Analysis | 4 |
| E.E. 306—Direct and Alternating Current Circuits | 3 | E.E. 308—Direct and Alternating Current Apparatus | 3 |
| E.E. 307—Direct and Alternating Current Laboratory | 1 | E.E. 309—Direct and Alternating Current Laboratory | 1 |
| M.E. 184—Metal Processing | 3 | M.E. 202—Thermodynamics | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | Approved Electives[1] | 3 |
| *Total* | 17 | *Total* | 18 |

[1] Geol. 150 for those choosing the structural option.

### Fourth Year

| | | | |
|---|---|---|---|
| C.E. 262—Structural Analysis | 3 | C.E. 264—Structural Design | 5 |
| C.E. 263—Elementary Structural Design | 2 | Econ. 257—Corporation Finance | 3 |
| C.E. 299—Inspection Trip | 0 | Eng. 292—Engineering Law | 3 |
| Eng. 230—Labor Relations, or Eng. 239—Industrial Engineering and Supervision | 3 | M.E. 208—Mechanical Engineering Laboratory | 3 |
| M.E. 203—Power Plant Equipment | 3 | Approved Electives | 4 |
| Met. E. 230—Engineering Metallurgy | 3 | | |
| Approved Electives | 4 | | |
| *Total* | 18 | *Total* | 18 |

## Curriculum in Mechanical Engineering

*For the Degree of Bachelor of Science in Mechanical Engineering*

### First Year

Common Program for Freshmen (page 112)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| M.E. 171—Mechanism | 2 | M.E. 184—Metal Processing, or M.E. 183—Materials Casting | 3 |
| M.E. 183—Materials Casting, or M.E. 184—Metal Processing | 3 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | T.A.M. 156—Analytical Mechanics (Statics and Dynamics) | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| E.E. 306—Direct and Alternating Current Circuits | 3 | E.E. 308—Direct and Alternating Current Apparatus | 3 |
| E.E. 307—Direct and Alternating Current Laboratory | 1 | M.E. 206—Thermodynamics | 3 |
| M.E. 205—Thermodynamics | 3 | M.E. 207—Power Plant Equipment | 3 |
| M.E. 223—Mechanics of Machinery | 3 | M.E. 208—Mechanical Engineering Laboratory | 3 |
| T.A.M. 221—Resistance of Materials | 3 | M.E. 224—Design of Machine Elements | 3 |
| Options | 6 | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| | | Options | 3 |
| *Total* | 19 | *Total* | 19 |

### Fourth Year

| | | | |
|---|---|---|---|
| M.E. 255—Mechanical Engineering Laboratory | 3 | M.E. 260—Heating, Ventilating, and Air Conditioning[1] | 3 |
| M.E. 271—Design of Machine Elements | 3 | M.E. 291—Mechanical Engineering Seminar | 1 |
| M.E. 299—Inspection Trip | 0 | Options | 12 |
| Options | 12 | | |
| *Total* | 18 | *Total* | 16 |

[1] To be taken in the first semester of the air conditioning and refrigeration option in place of approved electives.

All mechanical engineering students take the same subjects the first two years. During the third and fourth years students take the courses specified above and select, with guidance from the department advisers, one of the following options. Departmental electives in these options must be courses numbered above M.E. 249. Approved electives in the senior year must be upper level courses (junior or senior grade).

### General Option

This option permits selection of the courses to meet the needs of students whose interests differ from those who choose special options.

#### Third Year

| | | | |
|---|---|---|---|
| Approved Electives | 3 | Approved Electives | 3 |
| Non-technical Electives | 3 | | |

#### Fourth Year

| | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | Departmental Electives | 3 |
| Departmental Electives | 3 | Approved Electives | 6 |
| Approved Electives | 3 | Non-technical Electives | 3 |
| Non-technical Electives | 3 | | |

### Aeronautical Option

This option is designed for those mechanical engineering students who may be interested in the aircraft industry.

#### Third Year

| | | | |
|---|---|---|---|
| Aero. E. 211—Aerodynamics | 3 | Aero. E. 220—Aircraft Structures | 3 |
| Math. 387—Introduction to Numerical Methods, or Math. 345—Differential Equations and Orthogonal Functions, or Math. 341—Differential Equations | 3 | | |

#### Fourth Year

| | | | |
|---|---|---|---|
| Aero. E. 221—Aircraft Structures | 3 | Aero. E. 261—Aerodynamics Laboratory | 2 |
| M.E. 234—Heat Treatment of Metals | 3 | Aero. E. 264—Aircraft Structures Laboratory | 2 |
| M.E. 256—Internal Combustion Engines | 3 | M.E. 258—Combustion Engine and Turbine Laboratory | 3 |
| Non-technical Electives | 3 | Departmental Electives | 3 |
| | | Non-technical Electives | 2 |

### Air Conditioning and Refrigeration Option

This option provides for those interested in heating, ventilating, air conditioning, and refrigeration.

#### Third Year

| | | | |
|---|---|---|---|
| T.A.M. 232—Fluid Mechanics | 3 | Approved Electives | 3 |
| Non-technical Electives | 3 | | |

#### Fourth Year

| | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | M.E. 259—Refrigeration Engineering | 3 |
| M.E. 254—Heat Transfer | 3 | M.E. 261—Heating, Ventilating, and Air Conditioning Design | 3 |
| M.E. 260—Heating, Ventilating, and Air Conditioning | 3 | Approved Electives | 6 |
| Non-technical Electives | 3 | Non-technical Electives | 3 |

### Design Option

This option provides for specialization in mechanical engineering design.

### Third Year

| | | | |
|---|---|---|---|
| Approved Electives | 3 | Math. 345—Differential Equations and Orthogonal Functions, or Math. 341—Differential Equations | 3 |
| Non-technical Electives | 3 | | |

### Fourth Year

| | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | M.E. 272—Analytical design of High-Speed Engines, or M.E. 282—Tool Engineering | 3 |
| T.A.M. 311—Mechanical Vibrations | 3 | M.E. 273—Machine Design | 3 |
| T.A.M. 321—Advanced Mechanics of Materials, or M.E. 284—Welding Engineering | 3 | T.A.M. 326—Experimental Stress Analysis | 3 |
| Non-technical Electives | 3 | Non-technical Electives | 3 |

#### Petroleum Production Option

This option is designed for those students interested in the mechanical engineering aspects of petroleum production.

### Third Year

| | | | |
|---|---|---|---|
| Geol. 150—Geology for Engineers | 3 | Geol. 102—Historical Geology | 3 |
| T.A.M. 232—Fluid Mechanics | 3 | | |

### Fourth Year

| | | | |
|---|---|---|---|
| Geol. 246—Applied Petroleum Geology | 3 | C.E. 115—General Surveying | 3 |
| M.E. 234—Heat Treatment of Metals | 3 | Geol. 247—Applied Petroleum Geology | 3 |
| M.E. 371—Petroleum Production Engineering | 3 | M.E. 372—Petroleum Production Engineering | 3 |
| Non-technical Electives | 3 | Non-technical Electives | 3 |

#### Power Option

This option is for those students whose interests lie in the field of steam and gas power.

### Third Year

| | | | |
|---|---|---|---|
| T.A.M. 232—Fluid Mechanics | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| Non-technical Electives | 3 | | |

### Fourth Year

| | | | |
|---|---|---|---|
| M.E. 254—Heat Transfer | 3 | M.E. 257—Gas Turbines | 3 |
| M.E. 256—Internal Combustion Engines | 3 | M.E. 258—Combustion Engine and Turbine Laboratory | 3 |
| T.A.M. 311—Mechanical Vibrations | 3 | M.E. 274—Power Plant Design | 3 |
| Non-technical Electives | 3 | Non-technical Electives | 3 |

#### Production Option

This option provides emphasis on the production engineering aspects of mechanical engineering to meet the needs of those students planning on a career in the manufacturing industry.

### Third Year

| | | | |
|---|---|---|---|
| Econ. 108—Elements of Economics | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| M.E. 232—Motion and Time Study | 3 | | |

### Fourth Year

M.E. 231—Advanced Metal Processing 3
M.E. 281—Manufacturing Organization and Operation ..... 3
M.E. 284—Welding Engineering ..... 3
Non-technical Electives ..... 3
M.E. 282—Tool Engineering ..... 3
M.E. 283—Industrial Plant Design .... 3
Approved Electives ..... 3
Non-technical Electives ..... 3

Research Option

This option is intended for students interested in research and development.

### Third Year

Math. 387—Introduction to Numerical Methods, or Math. 345—Differential Equations and Orthogonal Functions, or Math. 341—Differential Equations ..... 3
T.A.M. 232—Fluid Mechanics ..... 3
M.E. 234—Heat Treatment of Metals 3

### Fourth Year

M.E. 254—Heat Transfer ..... 3
M.E. 297—Experimental Investigations 3
Non-technical Electives ..... 6
M.E. 298—Thesis, or Approved Elective 3
T.A.M. 311—Mechanical Vibrations 3
T.A.M. 321—Advanced Mechanics of Materials, or E.E. 212—Electronics 3
Non-technical Electives ..... 3

Railway Option

This option permits specialization in railway mechanical engineering.

### Third Year

T.A.M. 232—Fluid Mechanics ..... 3
Non-technical Electives ..... 3
M.E. 234—Heat Treatment of Metals 3

### Fourth Year

M.E. 231—Advanced Metal Processing 3
M.E. 256—Internal Combustion Engines ..... 3
M.E. 361—Railway Motive Power Equipment ..... 3
Non-technical Electives ..... 3
M.E. 259—Refrigeration Engineering 3
M.E. 274—Power Plant Design ..... 3
M.E. 362—Railway Motive Power Operation ..... 3
Non-technical Electives ..... 3

## Curriculum in Mining Engineering

*For the Degree of Bachelor of Science in Mining Engineering*

### First Year

Common Program for Freshmen (page 112)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Geol. 150—Geology for Engineers | 3 | Geol. 130—Mineralogy for Engineers | 3 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Min. E. 151—Elements of Mining | 4 | Min. E. 152—Fuels | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 19 | *Total* | 18 |

### Third Year

| | | | |
|---|---|---|---|
| C.E. 115—General Surveying | 3 | Econ. 240—Labor Problems, or Econ. 248—Personnel Administration | 3 |
| Econ. 108—Elements of Economics | 3 | E.E. 308—Direct and Alternating Current Apparatus | 3 |
| E.E. 306—Direct and Alternating Current Circuits | 3 | E.E. 309—Direct and Alternating Current Laboratory | 1 |
| E.E. 307—Direct and Alternating Current Laboratory | 1 | Geology Elective | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | M.E. 201—Steam, Air, and Gas Machinery | 3 |
| T.A.M. 232—Fluid Mechanics | 3 | Min. E. 204—Mine Surveying | 2 |
| T.A.M. 234—Laboratory in Fluid Mechanics | 1 | T.A.M. 221—Resistance of Materials | 3 |
| | | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| *Total* | 17 | *Total* | 19 |

### Summer

First and Second Weeks

Min. E. 205—Summer Mine Surveying .....2 hours

### Fourth Year

| | | | |
|---|---|---|---|
| Min. E. 251—Mine Administration | 3 | Met. E. 230—Engineering Metallurgy | 3 |
| Min. E. 253—Principles of Mining Methods | 4 | Min. E. 256—Mine Examination and Valuation | 2 |
| Min. E. 255—Mineral Dressing | 3 | Min. E. 258—Mining Design | 3 |
| Min. E. 257—Haulage, Hoisting, and Pumping | 4 | Min. E. 260—Coal Preparation | 2 |
| Min. E. 299—Inspection Trip | 0 | Min. E. 262—Mine Ventilation | 3 |
| Min. E. 351—Geophysics of Mining | 3 | Min. E. 396—Seminar | 1 |
| | | Approved Elective | 1 |
| *Total* | 17 | *Total* | 15 |

## Curriculum in Metallurgical Engineering

*For the Degree of Bachelor of Science in Metallurgical Engineering*

This curriculum is intended for the training of industrial metallurgists and those who wish to engage in advanced study and research either in operational processes or in various problems involving physical and chemical phases of metallurgy.

## First Year

Common Program for Freshmen (page 112), except that Chem. 105 and G.E.D. 106 are substituted for Chem. 104 and G.E.D. 101.

## Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 123—Quantitative Analysis for Engineers | 5 | Math. 142—Calculus | 3 |
| Math. 132—Calculus | 5 | Met. E. 150—Introduction to Metallurgy | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Military (men) | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 | Military (men) | 1 |
| | | Physical Education | 1 |
| | | Approved Electives | 3 |
| *Total* | 17 | *Total* | 18 |

## Third Year

| | | | |
|---|---|---|---|
| Cer. E. 221—Pyrometry | 2 | Chem. 246—Elementary Physical Chemistry | 3 |
| Chem. 245—Elementary Physical Chemistry | 3 | Met. E. 208—Ferrous Metallography | 3 |
| Met. E. 201—Principles of Physical Metallurgy | 3 | Met. E. 210—Ferrous Metallography Laboratory | 3 |
| Met. E. 203—Physical Metallurgy Laboratory | 1 | Met. E. 214—Electrometallurgy | 2 |
| Met. E. 205—Metallurgy of Iron and Steel | 3 | Met. E. 216—Electrometallurgy Laboratory | 1 |
| Met. E. 207—Metallurgical Calculations | 2 | T.A.M. 221—Resistance of Materials | 3 |
| Approved Electives | 3 | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| | | Approved Electives | 3 |
| *Total* | 17 | *Total* | 19 |

## Fourth Year

| | | | |
|---|---|---|---|
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 | E.E. 204—Applications of Electrical Equipment | 2 |
| E.E. 203—Direct and Alternating Current Circuits and Machines Laboratory | 1 | E.E. 205—Electrical Equipment Laboratory | 1 |
| Met. E. 251—Nonferrous Metallography | 3 | Met. E. 256—Metallurgy of Deep Drawing and Pressing | 3 |
| Met. E. 253—Nonferrous Metallography Laboratory | 3 | Met. E. 258—Alloy Steels | 3 |
| Met. E. 255—Metallurgy of Nonferrous Metals | 3 | Met. E. 260—Advanced Physical Metallurgy Laboratory | 3 |
| Met. E. 295—Metallurgical Seminar | 1 | Met. E. 296—Metallurgical Seminar | 1 |
| Met. E. 299—Inspection Trip | 0 | Approved Electives | 4 or 5 |
| T.A.M. 323—Advanced Laboratory in Materials Testing | 3 | | |
| Approved Electives | 3 | | |
| *Total* | 19 | *Total* | 17 or 18 |

# Curriculum in Sanitary Engineering[1]

*For the Degree of Bachelor of Science in Sanitary Engineering*

## First Year

Common Program for Freshmen (page 112). C.E. 101 (3 hours) and C.E. 102 (4 hours) are required courses which will be taught only at the summer surveying camp following the freshman year.

## Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| C.E. 103—Route Surveying | 3 | C.E. 140—Engineering in Public Health[2] | 3 |
| C.E. 160—Building Construction and Materials | 3 | Geol. 150—Engineering Geology[3] | 3 |
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 18 | *Total* | 18 |

NOTE: Transfer students who have completed two years' work and who have not had any surveying should attend summer surveying camp before starting their third year, otherwise they will take C.E. 111, 112, and 203 on the campus.

## Third Year

| | | | |
|---|---|---|---|
| C.E. 230—Soils and Bituminous Materials | 2 | Chem. 122—Elementary Quantitative Analysis | 5 |
| C.E. 235—Plain Concrete | 2 | C.E. 262—Structural Analysis | 3 |
| C.E. 261—Structural Analysis | 4 | C.E. 263—Elementary Structural Design | 2 |
| Econ. 108—Elements of Economics, or Speech 101—Principles of Effective Speaking[3] | 3 | M.E. 201—Mechanical Power Equipment | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | | |
| *Total* | 18 | *Total* | 17 |

Students who have completed three years in civil engineering can complete the sanitary engineering curriculum in one year, provided the substitution of Chem. 122 for the electives shown on page 117 is made in the sixth semester.

[1] Administered by the Department of Civil Engineering.

[2] Students who have had C.E. 140 are excused from Bact. 104.

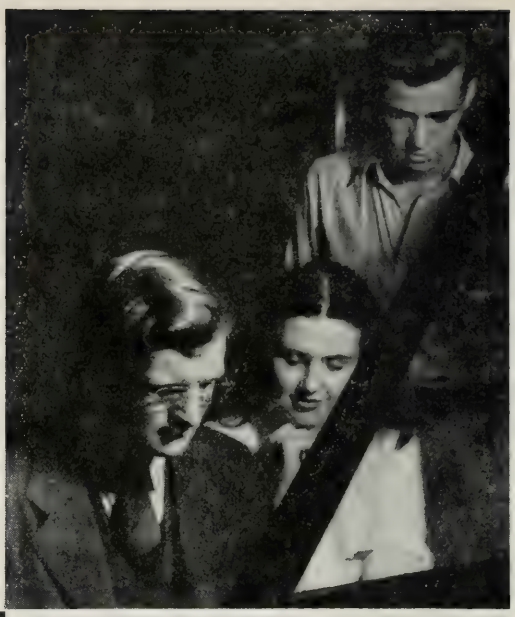
[3] Eight hours of credit in foreign language (French, German, or Spanish) may be substituted for Geol. 150 (3 hours), Econ. 108 or Speech 101 (3 hours), and approved electives (2 hours).

## Fourth Year

| | | | |
|---|---|---|---|
| Bact. 104—Introductory Bacteriology[1] | 3 | Chem. 132—Elementary Organic Chemistry | 3 |
| C.E. 220—Highways | 3 | C.E. 241—Sewerage | 3 |
| C.E. 240—Water Supply | 4 | C.E. 264—Structural Design | 5 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | C.E. 345—Public Health Engineering | 3 |
| C.E. 299—Inspection Trip | 0 | | |
| C.E. 344—Water and Sewage Treatment | 5 | | |
| *Total* | 15 to 18 | *Total* | 14 |

[1] Students who have had C.E. 140 are excused from Bact. 104.

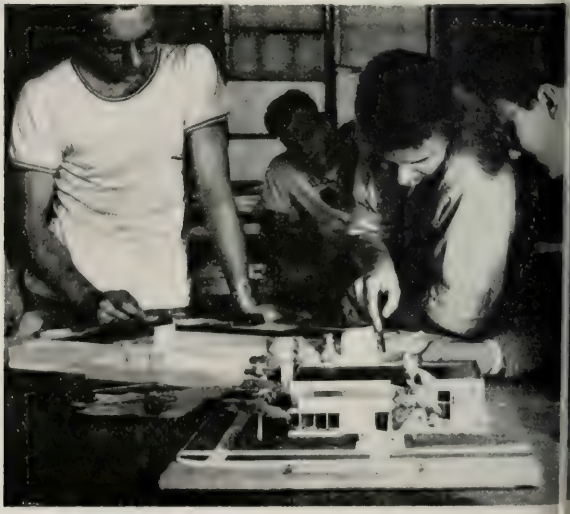
College of Fine and Applied Arts



Students Under Supervision of School of Music Faculty Member

Class in Still Life Painting

Architects Constructing a Model in Design Class



# College of Fine and Applied Arts

Art, architecture, landscape architecture, and music are taught in the College of Fine and Applied Arts. The professional curricula in all these subjects admit freshmen. In each curriculum the students are required to take certain basic and cultural courses, and other subjects essential to a liberal education, and are permitted to elect additional courses according to individual interests.

For students enrolled in other colleges and schools of the University at Urbana, the College of Fine and Applied Arts offers introductory courses designed to increase esthetic appreciation and to portray the role of the arts in civilization, as well as courses in applied music.

## Requirements for Graduation

Students who meet the general University requirements with respect to registration, residence, scholarship, fees, hygiene, military training, physical education, and rhetoric, and who maintain a satisfactory record, receive degrees appropriate to the curricula completed.

The curriculum in architecture, with two options, requires 165 semester hours for graduation. The degree of Bachelor of Architecture is awarded.

The curricula in painting, advertising design, industrial design, and history of art require 130 semester hours for the degree. The degree of Bachelor of Fine Arts is awarded in the curriculum completed. A curriculum leading to the degree of Bachelor of Fine Arts in Art Education is offered for students preparing to teach art. Graduation requires 130 semester hours in addition to physical education and military training.

The curricula in landscape architecture and landscape operation require 130 semester hours for graduation. The degree of Bachelor of Fine Arts in Landscape Architecture is conferred on students completing the former curriculum, and the degree of Bachelor of Science in Landscape Operation is conferred on those completing the latter.

The curriculum in music, with instrumental, voice, or theory major, leads to the degree of Bachelor of Music. This curriculum requires 130 semester hours for graduation. The curriculum in music education leads to the degree of Bachelor of Science in Music Education and requires 132 semester hours in addition to physical education and military training.

## Honors at Graduation

The honors awarded to superior students at graduation are designated on the diploma as Honors, High Honors, and Highest Honors. To be considered for honors, a student must have been in residence at the University for at least four semesters, or must have earned in residence a minimum of sixty-five hours credit. For the degree with Honors, the student must have a scholastic average of 4.0; for the degree with High Honors, a scholastic average of 4.25 (for transfer students no more than six hours of "D" in transferred credit); for the degree with Highest Honors, a scholastic average of 4.50 (for transfer students no hours of "D" in transferred credit).

## Special Requirements

**Foreign Language.** In curricula where a foreign language is required, a student who has completed one high school unit or more of a foreign language beyond the language entrance requirement may be excused from the curricular requirement to the extent that each high school unit is considered the equivalent of four semester hours of credit. Additional elective credit must be supplied for the credit requirement from which the student is excused.

**Inspection Trip.** Organized inspection trips are scheduled each semester in the curriculum in architecture, and each student is urged to participate in at least one trip each year. Students in certain art and landscape architecture classes also make trips to industrial and art centers.

## Departments and Curricula

The College of Fine and Applied Arts consists of the Department of Architecture, the Department of Art, the Department of Landscape Architecture, the School of Music, the University Bands, and the Bureau of Community Planning. The undergraduate curricula, which are described in the following paragraphs, are outlined on subsequent pages.

All departments in the College of Fine and Applied Arts reserve the right to retain, exhibit, and reproduce the work submitted by students for credit in any course.

**Architecture.** Architecture is concerned with the design and construction of efficient, safe, economical, and attractive buildings to satisfy man's need for shelter. The building industry is one of the largest in the nation in terms of expenditure and employment. For leadership the industry depends upon the architectural profession to develop new building types, new materials, and new systems of construction. The well-trained architect who can bring to these problems a high degree of technical knowledge, social insight, creative imagination, and business skill will find opportunities for service as well as ample rewards for his talents and efforts.

The curriculum in architecture contains a well-balanced program of general and technical training. The graduate who has acquired the necessary practical experience can, therefore, apply for state professional registration to practice. Technical subjects stress both a sound comprehension of fundamental theory and the logical solution of realistic problems met in practice. General studies include a liberal proportion of courses in the physical and social sciences and the humanities which can give the graduate that appreciation and understanding of society so necessary in achieving a useful career and a satisfying life.

The curriculum provides two options which allow the student to undertake advanced courses according to his special talents and interests. The general option offers advanced work in designing large buildings. The engineering option (formerly the separate curriculum in architectural engineering) emphasizes advanced courses in structural theory and design. Both options lead to the same degree, Bachelor of Architecture. Although students will normally make their choice of option at the beginning of the second year, the program is so arranged that the change may be made without difficulty at any time up to the middle of the fourth year. Graduate courses leading to a master's degree are offered under the regulations of the Graduate College.

The four-year curricula in architecture as published in the 1949-1950 Undergraduate Study bulletin will be in effect for students who entered college training prior to September, 1949.

The Department of Architecture occupies drafting rooms, studios, and offices in the Building for Architecture and Kindred Subjects. The Ricker Library in this building is one of the country's great collections in this field. It includes 24,743 volumes on architecture and the fine arts, 25,969 lantern slides, 21,217 mounted photographs and drawings, and 14,275 clippings. The department brings numerous outstanding architects to lecture on current professional topics and it conducts regular student field inspection trips to Chicago and nearby cities.

**Art.** The curricula in art permit a student to attain a proficiency in art and to secure a liberal education. The first year of the curricula is basic and cultural, and at the beginning of the second year the student chooses his field of specialization in one of the following options:

The curriculum in painting forms a preparation for the following fields of applied

art and for related fields: portraiture, illustration, mural decoration, and general creative painting.

The curriculum in industrial design trains designers for machine industries. This option aims to give the student a firm grasp of the principles of design, to develop in him speed and resourcefulness in expression, and to train him to adapt his knowledge and creative abilities to the conditions under which the designer must work in industry.

The curriculum in advertising design trains artists in the application of esthetic principles in the fields of advertising, printing, merchandising, and salesmanship.

The curriculum in art education offers specialization in teaching methods, materials, and processes and conforms to the regulations set down by the office of the State Superintendent of Public Instruction. This curriculum, while particularly designed for those students who are primarily interested in the teaching of art, affords preparation in the fields of art supervision and applied design.

The curriculum in the history of art offers opportunities for those who are interested in art criticism and history.

The Department of Art has a series of well-equipped and ideally lighted studios and modeling rooms in the Building for Architecture and Kindred Subjects. Additional studios are also maintained in Lincoln Hall, David Kinley Hall, Civil Engineering Hall, the Civil Engineering Surveying Building, the studio at 404 South Mathews Avenue, and the Graduate Studio.

This department has well-selected collections of models, casts, bronzes, paintings, etchings, and prints, and adequate collections of lantern slides and photographs of famous works of art. Professional models are employed as subjects for the classes in drawing, painting, and modeling from life. Art students share in the use of the Ricker Library which includes the literature of art as well as of architecture.

Courses in the history and appreciation of art, drawing, sculpture, crafts, and design are open to students from other colleges of the University.

Graduate courses leading to the degrees of Master of Fine Arts in Art Education, in the History of Art, and in Painting are offered under the regulations of the Graduate College.

**Landscape Architecture.** The instructional work in landscape architecture consists of a four-year curriculum leading to the degree of Bachelor of Fine Arts in Landscape Architecture, and is designed to prepare the student for professional practice by providing a carefully balanced program of technical courses and of basic courses in the humanities. A four-year curriculum in landscape operation, leading to the degree of Bachelor of Science in Landscape Operation, is offered for students preparing to enter the contracting and maintenance branches of landscape architecture. Courses in the appreciation of landscape architecture and planning are offered for students in other colleges of the University.

Graduate courses leading to the degree of Master of Fine Arts in Landscape Architecture or Master of Science in City Planning are offered under the regulations of the Graduate College.

The Department of Landscape Architecture occupies quarters in Mumford Hall, where it has drafting rooms and an excellent library. The collections of trees, shrubs, and other plants growing on the campus and about residences in the community, as well as a fine herbarium, furnish materials for the study of plants and of planting design.

**Music.** The School of Music offers a curriculum in music, with three options leading to the degree of Bachelor of Music, and a curriculum in music education leading to the degree of Bachelor of Science in Music Education. A student enrolled in any music curriculum pursues throughout the four years of his course (except the third and fourth years of the curriculum in music education) a major or principal applied subject (piano, voice, etc.) in which two thirty-minute lessons a week are taken; and a minor or secondary applied subject in which one thirty-minute lesson a week is taken for three years. Public performance is a definite part of the training in applied music and all students, when sufficiently advanced, are required to participate in the student programs. As part of the requirements for the Bachelor of Music degree, senior students must present a satisfactory public recital.

Courses leading to the Bachelor of Arts degree with a major in music (thirty-two hours) in the College of Liberal Arts and Sciences are offered to qualified students. Prescribed courses in music leading to this degree are predominantly in the fields of theory and history. Applicants are expected to have a rudimentary knowledge of theory and to

possess a moderate degree of proficiency on the piano. (See General Curriculum in Liberal Arts and Sciences, page 176.)

Applied music and courses in the history, theory, and appreciation of music are open to all qualified students in the University.

Graduate courses leading to the degree of Master of Music and the degrees of Master of Science and Doctor of Education in Music Education are offered under the regulations of the Graduate College.

The University Orchestras (Sinfonietta, Symphony Orchestra, Symphony II) and the University Choral Union (Oratorio Society, University Chorus, Women's Glee Club, Men's Glee Club, University Choir) are open to qualified students from any college. The Oratorio Society, University Chorus, Opera Workshop, Symphony Orchestra, and Symphony II are also open to members of the faculty and staff and singers of the community who are admitted by examination or by permission of the respective directors. All of these organizations hold weekly rehearsals and give public presentations throughout the school year.

The faculty and students of the School of Music present concerts and recitals each week of the school year. The School of Music also sponsors weekly radio broadcasts over station WILL. Chamber music concerts are given frequently throughout the year by the Walden String Quartet whose members are artists-in-residence and members of the faculty of the School of Music.

The School of Music occupies the Tina Weedon Smith Memorial Hall and three annex buildings which have soundproof studios, lecture rooms, classrooms, extensive equipment of musical instruments, a library, and an auditorium designed for public recitals and concerts.

### Electives

All electives in both options of the curriculum in architecture must be selected from courses in the humanities, social sciences, or biological sciences. Since these electives are intended to provide general education, no technical subjects will be approved. Students are urged to plan their electives in range and sequence so that in one or two areas they will be able to go beyond the introductory level.

Electives for other curricula may consist of any courses given in the University which are not required in the curriculum, do not parallel the subject matter of required courses, and are not open to freshmen. The following are exceptions: Bot. 100, 101; Geog. 101; Geol. 101; Hist. 111, 112, 131, 132; Lib. Sci. 195; Math. 111, 112, 114, 115, 122; Zool. 101.

## Curriculum in Architecture

### First Year

(The first year is common to both options of the curriculum in architecture)

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 181—Freehand Drawing | 2 | Arch. 101—Basic Design | 3 |
| G.E.D. 107—Architectural Projections | 2 | Art 182—Freehand Drawing | 2 |
| Math. 117—Combined Freshman Mathematics | 5 | G.E.D. 108—Architectural Projections | 2 |
| Rhet. 101—Rhetoric and Composition | 3 | Math. 127—Combined Freshman Mathematics | 4 |
| Hygiene 101—Health Lectures | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 16 | *Total* | 16 |

### GENERAL OPTION

*For the Degree of Bachelor of Architecture*

### First Year

Program for Freshmen (see above)

## Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Arch. 131—Architectural Design | 3 | Arch. 113—History of Ancient Architecture | 2 |
| Arch. 141—Materials and Methods of Construction I | 2 | Arch. 132—Architectural Design | 3 |
| Art 183—Freehand Drawing | 2 | Arch. 142—Materials and Methods of Construction II | 2 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 | Art 184—Freehand Drawing | 2 |
| Electives | 3 | T.A.M. 171—Elements of Mechanics | 3 |
| Physical Education | 1 | Electives | 3 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 17 | *Total* | 17 |

## Third Year

| | | | |
|---|---|---|---|
| Arch. 133—Architectural Design | 3 | Arch. 134—Architectural Design | 3 |
| Arch. 143—Materials and Methods of Construction III | 2 | Arch. 144—Materials and Methods of Construction IV | 2 |
| Arch. 214—History of Medieval Architecture | 3 | Arch. 215—History of Renaissance and Baroque Architecture | 3 |
| Art 281—Freehand Drawing | 2 | Arch. 245—Structural Elements | 3 |
| Sociol. 276—Sociology of the City | 3 | Art 282—Freehand Drawing | 2 |
| T.A.M. 172—Strength of Materials | 3 | Physics 102—General Physics (Mechanics, Heat, and Sound) | 5 |
| *Total* | 16 | *Total* | 18 |

## Fourth Year

| | | | |
|---|---|---|---|
| Arch. 216—Modern Architecture | 3 | Arch. 236—Architectural Design | 5 |
| Arch. 235—Architectural Design | 5 | Arch. 256—Building Sanitation | 2 |
| Arch. 246—Theory of Structural Design | 3 | Arch. 257—Reinforced Concrete Theory | 3 |
| Arch. 265—Theory of Architecture | 2 | L.A. (new)—City Planning | 3 |
| Electives | 3 | M.E. 252—Heating and Ventilating for Architectural Engineers | 4 |
| *Total* | 16 | *Total* | 17 |

## Fifth Year

| | | | |
|---|---|---|---|
| Arch. 244—Working Drawings | 2 | Arch. 283—Architectural Practice | 2 |
| Arch. 247—Structural Planning | 3 | Arch. 338—Architectural Design | 7 |
| Arch. 337—Architectural Design | 7 | E.E. 114—Wiring and Illumination | 3 |
| Art 150—Sculpture | 2 | Electives | 4 |
| Electives | 2 | | |
| *Total* | 16 | *Total* | 16 |

## ENGINEERING OPTION

*For the Degree of Bachelor of Architecture*

### First Year

Program for Freshmen (see page 136)

## Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Arch. 131—Architectural Design | 3 | Arch. 113—History of Ancient Architecture | 2 |
| Arch. 141—Materials and Methods of Construction I | 2 | Arch. 132—Architectural Design | 3 |
| Art 183—Freehand Drawing | 2 | Arch. 142—Materials and Methods of Construction II | 2 |
| Math. 137—Calculus | 3 | Art 184—Freehand Drawing | 2 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 | Math. 147—Calculus | 3 |
| Physical Education | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 17 | *Total* | 16 |

## Third Year

| | | | |
|---|---|---|---|
| Arch. 133—Architectural Design | 3 | Arch. 134—Architectural Design | 3 |
| Arch. 143—Materials and Methods of Construction III | 2 | Arch. 144—Materials and Methods of Construction IV | 2 |
| Arch. 214—History of Medieval Architecture | 3 | Arch. 215—History of Renaissance and Baroque Architecture | 3 |
| Art 281—Freehand Drawing | 2 | Arch. 245—Structural Elements | 3 |
| Sociol. 276—Sociology of the City | 3 | Art 282—Freehand Drawing | 2 |
| T.A.M. 221—Resistance of Materials | 3 | Physics 102—General Physics (Mechanics, Heat, and Sound) | 5 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | | |
| *Total* | 17 | *Total* | 18 |

## Fourth Year

| | | | |
|---|---|---|---|
| Arch. 216—History of Modern Architecture | 3 | Arch. 236—Architectural Design | 5 |
| Arch. 235—Architectural Design | 5 | Arch. 256—Building Sanitation | 2 |
| Arch. 246—Theory of Structural Design | 3 | Arch. 257—Reinforced Concrete Theory | 3 |
| Arch. 265—Theory of Architecture | 2 | M.E. 252—Heating and Ventilating for Architectural Engineers | 4 |
| Electives | 3 | Electives | 3 |
| *Total* | 16 | *Total* | 17 |

## Fifth Year

| | | | |
|---|---|---|---|
| Arch. 244—Working Drawings | 2 | Arch. 283—Architectural Practice | 2 |
| Arch. 247—Structural Planning | 3 | Arch. 348—Advanced Structures | 5 |
| Arch. 347—Theory of Structures | 5 | Arch. 358—Reinforced Concrete Design | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | E.E. 114—Wiring and Illumination | 3 |
| Electives | 3 | Electives | 3 |
| *Total* | 16 | *Total* | 16 |

## Curricula in Art

### First Year

(The first year is common to all curricula in art)

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Arch. 171—Elements of Drawing and Design | 3 | Arch. 172—Elements of Drawing and Design | 3 |
| Art 121—Art Form | 5 | Art 122—Art Form | 5 |
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Foreign Language | 4 | Foreign Language | 4 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 16 or 17 | *Total* | 18 or 19 |

## Curriculum in Advertising Design

*For the Degree of Bachelor of Fine Arts in Advertising Design*

### First Year

Program for Freshmen (see above)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 | Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 123—Life Drawing and Anatomy | 5 | Art 124—Life Drawing and Anatomy | 5 |
| Art 131—Elementary Composition | 2 | Art 132—Elementary Composition | 2 |
| Art 141—Still Life | 2 | Art 142—Still Life | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 3 | Electives | 3 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

### Third Year

| | | | |
|---|---|---|---|
| Art History | 3 | Art 224—Figure Drawing and Sketch | 3 |
| Art 223—Figure Drawing and Sketch | 3 | Art 262—Layout and Lettering | 3 |
| Art 261—Layout and Lettering | 3 | Art 266—Advertising Design | 3 |
| Art 265—Advertising Design | 3 | Journ. 281—Introduction to Advertising | 3 |
| Journ. 204—Typography | 2 | Electives | 4 |
| Electives | 2 | | |
| *Total* | 16 | *Total* | 16 |

### Fourth Year

| | | | |
|---|---|---|---|
| Art 235—Illustration | 2 | Art 211—History of Art in Industry | 2 |
| Art 267—Advanced Advertising Design | 5 | Art 236—Illustration | 2 |
| Electives | 8 | Art 268—Advanced Advertising Design | 5 |
| | | Electives | 4 to 8 |
| *Total* | 15 | *Total* | 13 to 17 |

## Curriculum in Industrial Design

*For the Degree of Bachelor of Fine Arts in Industrial Design*

### First Year

Program for Freshmen (page 139)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 | Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 133—Design Workshop | 2 | Art 134—Design Workshop | 2 |
| Art 151—Sculpture | 2 | Art 152—Sculpture | 2 |
| D.G.S. 141—Physical Science | 4 | D.G.S. 142—Physical Science | 4 |
| Math. 117—Combined Freshman Mathematics | 5 | Math. 127—Combined Freshman Mathematics | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 or 18 | *Total* | 16 or 17 |

### Third Year

| | | | |
|---|---|---|---|
| Art 261—Layout and Lettering | 3 | Art 104—Interior Design | 2 |
| Art 271—Materials and Processes | 2 | Art 262—Layout and Lettering | 3 |
| Art 275—Industrial Design | 3 | Art 272—Materials and Processes | 2 |
| G.E.D. 104—Advanced Drawing | 4 | Art 276—Industrial Design | 3 |
| T.A.M. 171—Elements of Mechanics | 3 | Econ. 108—Elements of Economics | 3 |
| | | T.A.M. 172—Strength of Materials | 3 |
| *Total* | 15 | *Total* | 16 |

### Fourth Year

| | | | |
|---|---|---|---|
| Advanced Art History | 3 | Accy. 201—Fundamentals of Accounting | 3 |
| Art 277—Advanced Industrial Design | 5 | Art 211—History of Art in Industry | 2 |
| Mktg. 101—Principles of Marketing | 3 | Art 278—Advanced Industrial Design | 5 |
| M.E. 182—Manufacturing Processes | 3 | Electives | 4 to 8 |
| *Total* | 14 | *Total* | 14 to 18 |

## Curriculum in Art Education

*For the Degree of Bachelor of Fine Arts in Art Education*

The courses outlined below total 134 to 138 hours. A minimum of 130 hours of credit, not counting the first two years of work in military training and physical education, is required for graduation. Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Desirable teaching combinations with art include English, French, industrial arts, Latin, and music.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Arch. 171—Elements of Drawing and Design | 3 |
| Art 121—Art Form | 5 |
| Language | 4 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Military (men) | 1 |
| Physical Education | 1 |
| *Total* | 16 or 17 |

| SECOND SEMESTER | HOURS |
|---|---|
| Arch. 172—Elements of Drawing and Design | 3 |
| Art 122—Art Form | 5 |
| Language | 4 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Military (men) | 1 |
| Physical Education | 1 |
| Hygiene 101—Health Lectures | 2 |
| *Total* | 18 or 19 |

## Second Year

| | |
|---|---|
| Art 125—Life Drawing | 2 |
| Art 131—Elementary Composition | 2 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Natural Science[1] | 3 |
| Military (men) | 1 |
| Physical Education | 1 |
| Electives[2] | 7 |
| *Total* | 17 or 18 |

| | |
|---|---|
| Art 126—Life Drawing | 2 |
| Art 132—Elementary Composition | 2 |
| Art 141—Still Life | 2 |
| Natural Science[1] | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Military (men) | 1 |
| Physical Education | 1 |
| Electives[2] | 3 |
| *Total* | 17 or 18 |

## Third Year

| | |
|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 |
| Art 171-178—Crafts[3] | 2 |
| Art 203—Art Education Laboratory | 2 |
| Art 235—Illustration | 2 |
| Pol. Sci. 150—American Government | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Electives | 3 |
| *Total* | 18 |

| | |
|---|---|
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 171-178—Crafts[3] | 2 |
| Art 204—Art Education Laboratory | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Electives | 4 |
| *Total* | 18 |

## Fourth Year

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 or 4 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Electives | 3 or 4 |
| *Total* | 15 |

| | |
|---|---|
| Advanced Art History | 3 |
| Art 101—Water Color | 2 |
| Art 171-178—Crafts[3] | 2 |
| Art 261—Layout and Lettering | 3 |
| Electives | 5 |
| *Total* | 15 |

[1] Botany, zoology, chemistry, physics, geology, geography, biology, general science, mathematics (excluding arithmetic), and physiology, or their equivalents in integrated courses.

[2] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Desirable teaching combinations with art include English, French, industrial arts, Latin, and music.

[3] Select any of the following two-hour craft courses offered by the Department of Art provided the necessary prerequisites are met: 171 and 172, Metalwork and Jewelry; 173 and 174, Pottery; 175 and 176, Leatherwork; 177 and 178, Bookbinding.

### Fifth Year

*For the Degree of Master of Fine Arts in Art Education*

| | UNITS | | UNITS |
|---|---|---|---|
| Art 493—Seminar | 1 | Advanced Art History | 3/4 |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education (Art) | 1 | Ed. 311—Psychology of Learning for Teachers | 1/2 |
| Two of the following: | | Ed. 312—Mental Hygiene and the School | 1/2 |
| Ed. 301—Philosophy of Education | 1/2 | Art Electives | 2 1/4 |
| Ed. 302—History of American Education | 1/2 | | |
| Ed. 303—Comparative Education | 1/2 | | |
| Ed. 304—Social Foundations of Education | 1/2 | | |
| Electives | 1 | | |
| *Total* | 4 | *Total* | 4 |

## UNDERGRADUATE MINOR IN ART EDUCATION

| | HOURS |
|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 |
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 125—Life Drawing | 2 |
| Art 131—Elementary Composition | 2 |
| Art 188—Introduction to Art Form | 2 |
| Art 189—Introduction to Art Form | 2 |
| Art 204—Art Education Laboratory | 2 |
| Crafts Elective[1] | 2 |
| *Total* | 18 |

## Curriculum in Painting

*For the Degree of Bachelor of Fine Arts in Painting*

### First Year

Program for Freshmen (page 139)

### Second Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 | Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 123—Life Drawing and Anatomy | 5 | Art 124—Life Drawing and Anatomy | 5 |
| Art 131—Elementary Composition | 2 | Art 132—Elementary Composition | 2 |
| Art 141—Still Life | 2 | Art 142—Still Life | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 3 | Electives | 3 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

[1] Select any of the following two-hour craft courses offered by the Department of Art provided the necessary prerequisites are met: 171 and 172, Metalwork and Jewelry; 173 and 174, Pottery; 175 and 176, Leatherwork; 177 and 178, Bookbinding.

### Third Year

| | | | |
|---|---|---|---|
| Art History | 3 | Art History | 3 |
| Art 221—Life Drawing and Portrait | 5 | Art 222—Life Drawing and Portrait | 5 |
| Art 231—Intermediate Composition | 3 | Art 232—Intermediate Composition | 3 |
| Art 235—Illustration | 2 | Art 236—Illustration | 2 |
| English or American Literature | 3 | English or American Literature | 3 |
| *Total* | 16 | *Total* | 16 |

### Fourth Year

| | | | |
|---|---|---|---|
| Art 233—Advanced Composition | 4 | Art 234—Advanced Composition | 4 |
| Art 241—Life Painting | 4 | Art 242—Life Painting | 4 |
| Art Electives | 2 | Art Electives | 2 |
| Electives | 4 to 6 | Electives | 4 to 6 |
| *Total* | 14 to 16 | *Total* | 14 to 16 |

## Curricula in Landscape Architecture

(The first and second years are common to both curricula in landscape architecture)

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Art 121—Art Form | 5 | Bot. 100—General Botany | 4 |
| G.E.D. 107—Architectural Projections | 2 | G.E.D. 108—Architectural Projections | 2 |
| L.A. 111—History of Landscape Architecture | 3 | L.A. 132—Elements of Landscape Architecture | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Math. 104—Elements of Algebra and Trigonometry | 3 |
| Hygiene 101—Health Lectures | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

### Second Year

| | | | |
|---|---|---|---|
| Arch. 175—Frame Construction Details | 2 | Arch. 176—Masonry Construction Details | 2 |
| C.E. 117—Surveying for Landscape Architects | 3 | Art 182—Freehand Drawing | 2 |
| English or American Literature | 3 | C.E. 118—Surveying for Landscape Architects | 3 |
| L.A. 133—Elementary Landscape Design | 3 | English or American Literature | 3 |
| Speech 101—Principles of Effective Speaking | 3 | L.A. 134—Elementary Landscape Design | 3 |
| Physical Education | 1 | Rhet. 133—Expository Writing | 3 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 15 or 16 | *Total* | 17 or 18 |

## Curriculum in Landscape Architecture

*For the Degree of Bachelor of Fine Arts in Landscape Architecture*

### First and Second Years

Program for Freshmen and Sophomores (see above)

### Third Year

| FIRST SEMESTER | HOURS |
|---|---|
| L.A. 213—Development and Theory of Contemporary Landscape Architecture | 3 |
| L.A. 235—Intermediate Landscape Design | 3 |
| L.A. 243—Landscape Construction | 3 |
| L.A. 251—Trees and Shrubs | 3 |
| Approved Elective | 3 |
| *Total* | 15 |

| SECOND SEMESTER | HOURS |
|---|---|
| History of Architecture | 3 |
| L.A. 236—Intermediate Landscape Design | 4 |
| L.A. 244—Landscape Construction | 3 |
| L.A. 252—Trees and Shrubs | 3 |
| Approved Elective | 2 |
| *Total* | 15 |

### Fourth Year

| | |
|---|---|
| L.A. 237—Advanced Landscape Design | 4 |
| L.A. 253—Planting Design | 4 |
| L.A. 255—Care of Plant Materials | 2 |
| L.A. 274—Regional Planning | 3 |
| Approved Elective | 3 |
| *Total* | 16 |

| | |
|---|---|
| L.A. 238—Advanced Landscape Design | 4 |
| L.A. 246—Office Practice | 2 |
| L.A. 254—Planting Design | 4 |
| L.A. 272—Planning of Towns and Cities | 3 |
| Approved Elective | 3 |
| *Total* | 16 |

## Curriculum in Landscape Operation

*For the Degree of Bachelor of Science in Landscape Operation*

### First and Second Years

Program for Freshmen and Sophomores (page 143)

### Third Year

| FIRST SEMESTER | HOURS |
|---|---|
| Accy. 201—Fundamentals of Accounting | 3 |
| Entom. 101—Destructive and Useful Insects | 3 |
| L.A. 243—Landscape Construction | 3 |
| L.A. 251—Trees and Shrubs | 3 |
| Elective | 3 |
| *Total* | 15 |

| SECOND SEMESTER | HOURS |
|---|---|
| Bus. Law. 261—Summary of Business Law | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| L.A. 244—Landscape Construction | 3 |
| L.A. 252—Trees and Shrubs | 3 |
| Rhet. 151—Business Letter Writing | 2 |
| Elective | 2 |
| *Total* | 16 |

### Fourth Year

| | |
|---|---|
| L.A. 235—Intermediate Landscape Design | 3 |
| L.A. 253—Planting Design | 4 |
| L.A. 255—Care of Plant Materials | 2 |
| Electives | 6 |
| *Total* | 15 |

| | |
|---|---|
| L.A. 236—Intermediate Landscape Design | 4 |
| L.A. 246—Office Practice | 2 |
| L.A. 248—Advanced Landscape Construction | 3 |
| L.A. 254—Planting Design | 4 |
| L.A. 272—Planning of Towns and Cities | 3 |
| *Total* | 16 |

# Curriculum in Music

*For the Degree of Bachelor of Music*

## INSTRUMENTAL MAJOR

The instrumental major may be taken in piano, violin, viola, violoncello, string bass, organ, flute, clarinet, oboe, bassoon, cornet, french horn, trombone, baritone, tuba, percussion, harp, or band and orchestral instruments.

A student enrolled in this curriculum takes two applied subjects, one a major (thirty-two hours) and the other a minor (twelve hours). In the band and orchestral instruments major, the major applied music subject includes work on supplementary band and orchestral instruments and conducting. Eight hours are required in the minor subject.

A placement examination in theory is given on entrance. Students who fail to pass are required to take Music 100, Rudiments of Theory (two hours) before registering in Music 102.

Music 210 and 211, Instrumentation, are required of band and orchestra majors instead of Music 302 and 303. Organ majors are required to take two semesters of Music 306 (three hours each semester) for work in double counterpoint, canon, and fugue instead of Music 302 and 303. Piano majors may elect Music 306 for three or five hours credit instead of Music 302 and 303. Music 266 is required of piano, voice, and string majors only.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Major Applied Music Subject | 4 | Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 | Minor Applied Music Subject | 2 |
| Music 102—Theory of Music | 4 | Music 103—Theory of Music | 4 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 14 to 16 | *Total* | 16 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Major Applied Music Subject | 4 | Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 | Minor Applied Music Subject | 2 |
| Music 106—Theory of Music | 4 | Music 107—Theory of Music | 4 |
| Music 120—Introduction to the History of Music | 2 | Music 121—Introduction to the History of Music | 2 |
| French, German, or Italian | 4 | French, German, or Italian | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 or 18 | *Total* | 17 or 18 |

### Third Year

| | | | |
|---|---|---|---|
| Major Applied Music Subject | 4 | Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 | Minor Applied Music Subject | 2 |
| Music 226—History of Music | 2 | Music 227—History of Music | 2 |
| Music 300—Theory of Music | 2 | Music 301—Theory of Music | 2 |
| Music 314—Analysis of Musical Form | 2 | Music 315—Analysis of Musical Form | 2 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Electives | 3 | Electives | 3 |
| *Total* | 15½ | *Total* | 15½ |

### Fourth Year

| | |
|---|---|
| Major Applied Music Subject | 4 |
| Music 266—Applied Music Pedagogy | 1 |
| Music 302—Theory of Music | 2 |
| Music 320—Advanced History of Music | 2 |
| Music Ensemble | ½ |
| Electives | 5 to 8 |
| *Total* | 14½ to 17½ |

| | |
|---|---|
| Major Applied Music Subject | 4 |
| Music 266—Applied Music Pedagogy | 1 |
| Music 303—Theory of Music | 2 |
| Music 321—Advanced History of Music | 2 |
| Music Ensemble | ½ |
| Electives | 5 to 8 |
| *Total* | 14½ to 17½ |

## VOICE MAJOR

The major applied music subject throughout the course includes classes in singing diction as well as private lessons in voice. At least eight hours each of Italian, French, and German are required for the voice major. Two years of high school language are equivalent to eight hours of University credit in language.

### First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Music 102—Theory of Music | 4 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 180—Voice Diction (English) | 1 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 14 to 16 |

| SECOND SEMESTER | HOURS |
|---|---|
| Music 103—Theory of Music | 4 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 181—Voice Diction (Italian) | 1 |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Hygiene 101—Health Lectures | 2 |
| *Total* | 16 to 18 |

### Second Year

| | |
|---|---|
| Music 106—Theory of Music | 4 |
| Music 120—Introduction to the History of Music | 2 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 182—Voice Diction (German) | 1 |
| Foreign Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 17 or 18 |

| | |
|---|---|
| Music 107—Theory of Music | 4 |
| Music 121—Introduction to the History of Music | 2 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 183—Voice Diction (German) | 1 |
| Foreign Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 17 or 18 |

### Third Year

| | |
|---|---|
| Minor Applied Music Subject | 2 |
| Music Ensemble | ½ |
| Music 226—History of Music | 2 |
| Music 300—Theory of Music | 2 |
| Music 314—Analysis of Musical Form | 2 |
| Music 361—Voice | 3 |
| Music 380—Voice Diction (French) | 1 |
| Foreign Language | 4 |
| *Total* | 16½ |

| | |
|---|---|
| Minor Applied Music Subject | 2 |
| Music Ensemble | ½ |
| Music 227—History of Music | 2 |
| Music 301—Theory of Music | 2 |
| Music 315—Analysis of Musical Form | 2 |
| Music 361—Voice | 3 |
| Music 381—Voice Diction (French) | 1 |
| Foreign Language | 4 |
| *Total* | 16½ |

### Fourth Year

| | | | |
|---|---|---|---|
| Music Ensemble | ½ | Music Ensemble | ½ |
| Music 266—Applied Music Pedagogy | 1 | Music 266—Applied Music Pedagogy | 1 |
| Music 320—Advanced History of Music | 2 | Music 321—Advanced History of Music | 2 |
| Music 361—Voice | 3 | Music 361—Voice | 3 |
| Music 382—Voice Diction | 1 | Music 383—Voice Diction | 1 |
| Electives | 6 to 9 | Electives | 6 to 9 |
| *Total* | 13½ to 16½ | *Total* | 13½ to 16½ |

### THEORY MAJOR

A student may take a major in theory of music only on recommendation of the Theory Division. The complete theory course offered in the instrumental major must be completed. Music 210, 211, and 306 must be taken in the third and fourth years. A recital of original compositions is required.

The student will continue the study of applied music for major credit throughout three years of his course of study. Whether or not piano is the major instrument, the student should acquire a thorough practical knowledge of the pianoforte. He will spend at least one semester each in the study of three instruments, one in each section of the orchestra, i.e., string, woodwind, and brass.

## Curriculum in Music Education

*For the Degree of Bachelor of Science in Music Education*

The minimum requirements for teaching music in the primary and secondary schools are (1) that the teacher be sufficiently proficient on the piano to play accompaniments of music education materials and to play at sight such materials as hymns, community songs, and folk songs; and (2) that he have a sufficient knowledge of voice to sing with a pleasant tone quality, to sing at sight, and to be able to impart the principles of voice production. Students who can not meet these requirements must take additional work in the branches of applied music in which they are deficient.

The courses outlined below total 136 to 140 hours. A minimum of 132 semester hours, plus the requirements of the first two years of work in military training and physical education, is required for graduation.

At the end of the sophomore year a committee will investigate each music education student. The following points will be taken into consideration: musicianship, scholarship, personality, and leadership. The exceptionally good music student will be permitted to use, if he so wishes, music as a minor area of specialization. Those students who present an acceptable music minor within their curriculum will be required to take a minimum of sixteen hours of electives in the following: art, social studies (especially courses concerned with current social problems), biological science, and physical science. Other students will be requested to select a nonmusic subject as a minor area of specialization and accumulate a minimum of sixteen hours in the area. Desirable teaching combinations with music include art, English, French, German, Latin, physical education, and Spanish.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file application for admission to Educational Practice (Ed. 232 and 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 232 and 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## PIANO AND VOICE MAJOR

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Principal Applied Music Subject | 4 | Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject | 2 | Secondary Applied Music Subject | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 | D.G.S. 112—Verbal Communication[1] | 4 |
| Music 102—Theory of Music | 4 | Music 103—Theory of Music | 4 |
| Military (men) | 1 | Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 | Military (men) | 1 |
| | | Physical Education | 1 |
| *Total* | 15 or 16 | *Total* | 17 or 18 |

### Second Year

| | | | |
|---|---|---|---|
| Principal Applied Music Subject | 4 | Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject | 2 | Secondary Applied Music Subject[2] | 2 |
| Music 106—Theory of Music | 4 | Music 107—Theory of Music | 4 |
| Music 184—String Instruments | 2 | Music 185—String Instruments | 2 |
| Music Ensemble | ½ | Wind Instruments | 2 |
| Psych. 100—Introduction to Psychology | 4 | Music Ensemble | ½ |
| Military (men) | 1 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Physical Education | 1 | Military (men) | 1 |
| | | Physical Education | 1 |
| *Total* | 17½ or 18½ | *Total* | 17½ or 18½ |

### Third Year

| | | | |
|---|---|---|---|
| Music 186—String Instruments | 2 | Music 187—String Instruments | 2 |
| Wind Instruments | 2 | Wind Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 | Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 224—History and Appreciation of Music | 2 | Music 225—History and Appreciation of Music | 2 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 | Pol. Sci. 150—American Government | 3 |
| Ed. 240—Principles of Secondary Education | 2 | Electives | 6 |
| Electives | 6 | | |
| *Total* | 18½ | *Total* | 18½ |

### Fourth Year

| | | | |
|---|---|---|---|
| Music 210—Instrumentation | 2 | Music 211—Instrumentation | 2 |
| Music 217—Instrumental School Music and Conducting | 3 | Wind Instruments | 2 |
| Ed. 211—Educational Psychology | 3 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Ed. 232—Educational Practice in Elementary Education | 2 | Physics 232—Physics of Music | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Electives | 7 |
| Ed. 242—Educational Practice in Secondary Education | 3 | | |
| *Total* | 16 | *Total* | 16 |

[1] Rhet. 101-102 and Speech 141 or 101 may be taken instead of D.G.S. 111-112.

[2] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours in excess of the 132 hours required for graduation.

## WIND INSTRUMENT MAJOR

### First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 102—Theory of Music | 4 |
| Music 160—Piano | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 |
| Military (men) | 1 |
| Physical Education | 1 |
| *Total* | 15 or 16 |

| SECOND SEMESTER | HOURS |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 103—Theory of Music | 4 |
| Music 160—Piano | 2 |
| D.G.S. 112—Verbal Communication[1] | 4 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 |
| Physical Education | 1 |
| *Total* | 17 or 18 |

### Second Year

| | |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 106—Theory of Music | 4 |
| Music 160—Piano | 2 |
| Music 184—String Instruments | 2 |
| Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 |
| Military (men) | 1 |
| Physical Education | 1 |
| *Total* | 17½ or 18½ |

| | |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 107—Theory of Music | 4 |
| Music 160—Piano[2] | 2 |
| Music 185—String Instruments | 2 |
| Music Ensemble | ½ |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Military (men) | 1 |
| Physical Education | 1 |
| Electives | 2 |
| *Total* | 17½ or 18½ |

### Third Year

| | |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Music 161—Voice | 2 |
| Music 186—String Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 |
| Music 224—History and Appreciation of Music | 2 |
| Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Electives | 4 |
| *Total* | 18½ |

| | |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Music 161—Voice[2] | 2 |
| Music 187—String Instruments | 2 |
| Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 225—History and Appreciation of Music | 2 |
| Music Ensemble | ½ |
| Electives | 7 |
| *Total* | 18½ |

[1] Rhet. 101-102 and Speech 141 or 101 may be taken instead of D.G.S. 111-112.

[2] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours work in excess of the 132 hours required for graduation.

### Fourth Year

| | | | |
|---|---|---|---|
| Music 210—Instrumentation | 2 | Music 211—Instrumentation | 2 |
| Music 217—Instrumental School Music and Conducting | 3 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Ed. 211—Educational Psychology | 3 | Physics 232—Physics of Music | 2 |
| Ed. 232—Educational Practice in Elementary Education | 2 | Pol. Sci. 150—American Government | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Electives | 6 |
| Ed. 242—Educational Practice in Secondary Education | 3 | | |
| *Total* | 16 | *Total* | 16 |

## TIMPANI AND PERCUSSION MAJOR

The program for the timpani and percussion major is identical with that for the wind instrument major, except that two hours of Principal Applied Percussion Instrument is substituted for two hours of Principal Applied Wind Instrument during each semester of the first three years.

## STRING INSTRUMENT MAJOR

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Principal Applied String Instrument | 4 | Principal Applied String Instrument | 4 |
| Music 160—Piano | 2 | Music 160—Piano | 2 |
| Music 102—Theory of Music | 4 | Music 103—Theory of Music | 4 |
| D.G.S. 111—Verbal Communication[1] | 4 | D.G.S. 112—Verbal Communication[1] | 4 |
| Military (men) | 1 | Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 | Military (men) | 1 |
| | | Physical Education | 1 |
| *Total* | 15 or 16 | *Total* | 17 or 18 |

### Second Year

| | | | |
|---|---|---|---|
| Principal Applied String Instrument | 2 | Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 | Music 185—String Instruments | 2 |
| Music 160—Piano | 2 | Music 160—Piano[2] | 2 |
| Wind Instruments | 2 | Wind Instruments | 2 |
| Music 106—Theory of Music | 4 | Music 107—Theory of Music | 4 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Military (men) | 1 | Military (men) | 1 |
| Physical Education | 1 | Physical Education | 1 |
| | | Electives | 2 |
| *Total* | 17½ or 18½ | *Total* | 17½ or 18½ |

[1] Rhet. 101-102 and Speech 141 or 101 may be taken instead of D.G.S. 111-112.

[2] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours of work in excess of the 132 hours required for graduation.

### Third Year

| | | | |
|---|---|---|---|
| Principal Applied String Instrument | 2 | Principal Applied String Instrument | 2 |
| Music 250—String Ensemble | 1 | Music 250—String Ensemble | 1 |
| Music 161—Voice | 2 | Music 161—Voice[1] | 2 |
| Wind Instruments | 2 | Wind Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 | Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 224—History and Appreciation of Music | 2 | Music 225—History and Appreciation of Music | 2 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 | Electives | 6 |
| Ed. 240—Principles of Secondary Education | 2 | | |
| Electives | 3 | | |
| *Total* | 18½ | *Total* | 18½ |

### Fourth Year

| | | | |
|---|---|---|---|
| Music 210—Instrumentation | 2 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Music 217—Instrumental School Music and Conducting | 3 | Music 211—Instrumentation | 2 |
| Ed. 211—Educational Psychology | 3 | Physics 232—Physics of Music | 2 |
| Ed. 232—Educational Practice in Elementary Education | 2 | Pol. Sci. 150—American Government | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Electives | 6 |
| Ed. 242—Educational Practice in Secondary Education | 3 | | |
| *Total* | 16 | *Total* | 16 |

## STRING INSTRUMENT MAJOR

(Irregular Entrance)

Because of the great need for teachers of string instruments in the public schools, exceptional students who have had no string training will be permitted to enroll in this curriculum provided they can pass the entrance examination in voice, piano, or on a wind instrument. These students will follow the curriculum outlined below.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Principal Applied String Instrument | 2 | Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 | Music 185—String Instruments | 2 |
| Music 160—Piano | 2 | Music 160—Piano | 2 |
| Music 102—Theory of Music | 4 | Music 103—Theory of Music | 4 |
| D.G.S. 111—Verbal Communication[2] | 4 | D.G.S. 112—Verbal Communication[2] | 4 |
| Military (men) | 1 | Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 | Military (men) | 1 |
| | | Physical Education | 1 |
| *Total* | 15 or 16 | *Total* | 17 or 18 |

[1] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours of work in excess of the 132 hours required for graduation.
[2] Rhet. 101-102 and Speech 141 or 101 may be taken instead of D.G.S. 111-112.

### Second Year

| | | | |
|---|---|---|---|
| Principal Applied String Instrument | 2 | Principal Applied String Instrument | 2 |
| Music 186—String Instruments | 2 | Music 187—String Instruments | 2 |
| Music 160—Piano | 2 | Music 160—Piano[1] | 2 |
| Wind Instruments | 2 | Wind Instruments | 2 |
| Music 106—Theory of Music | 4 | Music 107—Theory of Music | 4 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Military (men) | 1 | Military (men) | 1 |
| Physical Education | 1 | Physical Education | 1 |
| | | Electives | 2 |
| *Total* | 17½ or 18½ | *Total* | 17½ or 18½ |

### Third and Fourth Years

(The third and fourth years are the same as those of a regular string instrument major.)

### Fifth Year

*For the Degree of Master of Science in Music Education*

| | UNITS | | UNITS |
|---|---|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| Music Electives[2] | 2 | Ed. 302—History of American Education | ½ |
| Electives[2] | 1 | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| | | Music 427—Administration and Supervision of Music Education | 1 |
| | | Music Electives[2] | 1 |
| | | Electives[2] | 1 |
| *Total* | 4 | *Total* | 4 |

## UNDERGRADUATE MINORS IN MUSIC

INSTRUMENTAL MINOR

| | HOURS |
|---|---|
| Music 160—Piano, or Music 163—Violin, or Music 164-176—Band and Orchestral Instruments (to be chosen with consent of adviser) | 4 |
| Music 184, 185—String Instruments | 4 |
| Music 190, 192, 194, 196, 198—Wind Instruments[3] | 4 |
| Music 217—Instrumental School Music and Conducting | 3 |
| Music 224 or 225—History and Appreciation of Music | 2 |
| *Total* | 17 |

[1] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours of work in excess of the 132 hours required for graduation.

[2] Of the five units of electives in the fifth year, a maximum of two units is allowed in applied music.

[3] Students are required to take two of these courses.

VOCAL MINOR

| | |
|---|---|
| Music 100—Rudiments of Theory | 2 |
| Music 160—Piano | 4 |
| Music 161—Voice | 4 |
| Music 214—Elementary and Junior High School Music | 2 |
| Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 224 or 225—History and Appreciation of Music | 2 |
| Music Ensemble—Vocal Dictions | 1 |
| *Total* | 18 |

## University of Illinois Bands

The University Bands are regularly organized in three groups: the Concert Band, the First Regimental Band, and the Second Regimental Band. Membership in these organizations is determined by a playing examination, and assignments are made according to proficiency and instrumentation. Credit in the Bands may be substituted for credit in required military courses. Members of the Concert Band in their third and succeeding years who have satisfied their military requirements are eligible for achievement awards amounting approximately to the tuition fees charged students residing in Illinois.

The Bands play numerous concerts on the campus, and the Concert Band also appears in many Illinois and other midwestern cities. In addition, the Bands furnish music for Commencement, convocations, athletic events, military ceremonies, and other occasions. The University owns a large library of band music and was bequeathed the John Philip Sousa Memorial Library. These collections comprise one of the largest and finest libraries of band music in the world.

The Concert Band maintains a complete symphonic instrumentation for the study and performance of all types of band literature and is open to those who have attained a high level of musical and technical proficiency on their instruments. The First Regimental Band maintains the instrumentation of the standard band and serves as a training organization for the Concert Band. The Second Regimental Band enrolls those who do not at first qualify for positions in the other bands, with eligibility for promotion as improvement is shown and vacancies occur. Membership, particularly in the Concert and First Regimental Bands, is open to women students as well as men.

Further information may be obtained by addressing the Director of University Bands, Band Building, Urbana.

School of Journalism and Communications

Gregory Hall

Student Radio Production

# School of Journalism and Communications

For those who have had two years of college work, the School of Journalism and Communications offers an additional two years of professional training, leading to the degree of Bachelor of Science.

The editorial curriculum is designed for those wishing to prepare themselves for positions as editors, reporters, and writers for newspapers, magazines, and technical publications. The advertising curriculum is intended especially for those expecting to enter the advertising departments of newspapers, magazines, radio stations, industrial organizations, or retail stores. The publication management curriculum is planned for those who are particularly interested in management and circulation, community weeklies, or in trade and technical publications. The radio curriculum prepares students for all forms of radio journalism. Instruction in this curriculum makes use of the radio facilities operated jointly by Radio Station WILL and the School of Journalism and Communications.

Instruction in journalism at the University was begun in 1902 as part of the courses in rhetoric and was organized as a division of the Department of English in 1916. The School of Journalism was established in 1927 as a separate administrative unit, and in 1941 it was moved into quarters designed especially for its use in Gregory Hall. In 1950 the name was changed to School of Journalism and Communications with divisions of journalism, radio, and advertising.

The four curricula of the School of Journalism and Communications—editorial, advertising, publication management, and radio—have been accredited by the American Council on Education for Journalism. The standing of the school has been endorsed by the American Society of Newspaper Editors, American Newspaper Publishers Association, Southern Newspaper Publishers Association, Inland Daily Press Association, National Editorial Association, Illinois Press Association, International Circulation Managers Association, Council on Radio Journalism, and the Newspaper Advertising Executives Association.

## Journalism Library, Laboratories, and Equipment

In its quarters in Gregory Hall the School of Journalism and Communications trains communications workers with modern equipment which includes the journalism library containing 4,500 books, the morgue, newspaper files, newsrooms, photography and photoengraving darkrooms, radio classrooms and broadcasting studios, printing laboratory, advertising layout laboratory, and community journalism facilities.

Radio students make use of portable tape recorders for assignments. Both newspaper and radio wire copy come to the copy desks for use by the student editors. Typography students work with engraving and stereotyping processes, and photographers have a com-

pletely equipped laboratory with ten darkrooms, workrooms, and studio. Press cameras are available for classroom and outside assignments.

## Prejournalism Preparation

Students planning to enter the School of Journalism and Communications are advised to register as prejournalism freshmen and sophomores following either the general curriculum or that of the Division of General Studies in the College of Liberal Arts and Sciences. The prejournalism student will find it to his advantage to include in his freshman and sophomore program courses in rhetoric and composition, ten hours of science (which may include mathematics), and twelve hours of social sciences (history, political science, economics, sociology, and psychology). The ability to use a typewriter should be acquired before entering the school.

## Requirements for Admission

For admission to the School of Journalism and Communications as a candidate for a degree, a student must meet the following requirements:

1. Complete fifty-six semester hours of undergraduate college work, exclusive of the required courses in military and physical education.

2. Present a grade-point average of 3.5. No applicant whose grade-point average in all college work is less than 3.5 will be admitted except on approval by the school of an individual petition for admission.

Students from schools of journalism of approved standing who comply with the requirements for admission to the School of Journalism and Communications at the University may receive by transfer not more than one year of credit in the School. Not more than half of the thirty hours of journalism required for a degree may be transferred from other schools or colleges.

## Requirements for Graduation

The School of Journalism and Communications offers four programs of study leading to the degree of Bachelor of Science in Journalism: editorial, advertising, publication management, and radio. The requirements for this degree (in addition to the general University requirements as to registration, residence, scholarship, fees, and courses in hygiene, military training, physical education, and rhetoric) include:

1. A total of 124 hours of credit, not counting the first two years in military training and physical education.

2. Not less than thirty hours nor more than forty hours in journalism, and twenty hours in advanced social studies, arts, and sciences, and in other subjects taken in the third or fourth year and approved by the faculty.

3. Completion of the requirements of one of the four curricula offered by the school.

4. The student must obtain an average grade of "C" in courses taken at the University and presented for the degree. The fifty-six hours required for admission to the School of Journalism and Communications are not included in the computation.

5. The home economics minor may be substituted for the requirement of twenty hours in advanced social studies.

## Honors at Graduation

For graduation with Honors a student must obtain an average of 4.35 in all courses taken after admission to the school; and for graduation with High Honors, an average of 4.75.

## Editorial Curriculum

*For the Degree of Bachelor of Science in Journalism*

### Third Year

| | HOURS |
|---|---|
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 212—Reporting Practice | 3 |
| Journ. 217—History of Journalism, or Journ. 218—The Press and Public Opinion | 3 |
| Journ. 281—Introduction to Advertising, or Journ. 241—Newspaper Management, or Journ. 244—Community Newspaper Publication | 3 |

### Fourth Year

| | HOURS |
|---|---|
| Journ. 227—Magazine Article Writing, or Journ. 328—Industrial Publications, or Journ. 320—Editorial Studies and Writing, or Journ. 365—Radio News | 2 or 3 |
| Journ. 311—Newspaper Law | 3 |
| Journ. 321—Copyreading | 4 |
| Journ. 323—Advanced Reporting | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of required and elective journalism courses to meet the minimum requirement of thirty hours, and enough hours of general electives to meet the requirement of 124 hours for graduation.

## Advertising Curriculum

*For the Degree of Bachelor of Science in Journalism*

### Third Year

| | HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Journ. 382—Advertising Copy and Layout | 4 |
| Mktg. 101—Marketing Organization and Operation | 3 |

### Fourth Year

| | HOURS |
|---|---|
| Journ. 283—Current Advertising Developments | 1 |
| Journ. 383—Advertising Media | 2 |
| Journ. 384—Advertising Campaigns | 3 |
| Journ. 385—Advertising Promotion and Sales, or Journ. 386—Radio Advertising | 3 or 2 |
| Mktg. 321—Marketing Research and Policies, or Mktg. 211—Principles of Retailing | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of required and elective journalism courses to meet the minimum requirement of thirty hours, and enough hours of general electives to meet the requirement of 124 hours for graduation.

### Electives

Recommended list of electives in other colleges to be taken in the third or fourth year and approved as counting toward the twenty hours required in social sciences:

| | HOURS |
|---|---|
| Art 181—Freehand Drawing, or Art 188—Introduction to Art Form | 2 |
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 170—Elements of Statistics, or Math. 161—Statistics | 3 |
| Econ. 240—Labor Problems | 3 |
| Econ. 379—Consumer Economics | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Mktg. 211—Principles of Retailing | 3 |
| Mktg. 271—Salesmanship | 2 |
| Mktg. 315—Retail Buying | 2 |

| | |
|---|---|
| Mktg. 323—Problems in Marketing | 3 |
| Mktg. 373—Sales Management | 2 |
| Psych. 100—Introduction to Psychology | 4 |
| Psych. 155—Social Psychology | 3 |
| Psych. 226—Emotion and Motivation | 3 |
| Rhet. 272—Report Writing | 2 |
| Sociol. 100—Principles of Sociology | 3 |
| Sociol. 243—Social Evolution | 3 |
| Sociol. 270—Population and Human Ecology | 3 |
| Sociol. 271—Sociology of the Region | 3 |

## Publication Management Curriculum

*For the Degree of Bachelor of Science in Journalism*

### Third Year

| | HOURS |
|---|---|
| Accy. 201—Fundamentals of Accounting[1] | 3 |
| Econ. 108—Elements of Economics[1] | 3 |
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 212—Reporting Practice | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Journ. 241—Newspaper Management | 3 |
| Journ. 382—Advertising Copy and Layout | 4 |

### Fourth Year

| | HOURS |
|---|---|
| Journ. 217—History of Journalism, or Journ. 218—The Press and Public Opinion | 3 |
| Journ. 244—Community Newspaper Publication, or Journ. 328—Industrial Publications | 3 or 2 |
| Journ. 311—Newspaper Law, or Journ. 321—Copyreading | 3 or 4 |
| Journ. 343—Newspaper Circulation Problems, or Journ. 385—Advertising Promotion and Sales | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of journalism electives for a total of thirty hours in required and elective journalism courses, and enough hours of general electives to meet the requirement of 124 hours for graduation.

During their fourth year, students are advised to elect course combinations in line with their field of specialization as follows: Trade and Technical Publication Management (Journ. 328 and 343, or 385); Community Newspaper Management (Journ. 244 and 343, or 385); Daily Newspaper Management (Journ. 343 or 385).

### Electives

Recommended list of electives in other colleges to be taken in the third or fourth year and approved as counting toward the twenty hours required in social sciences:

| | HOURS |
|---|---|
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 170—Elements of Statistics, or Math. 161—Statistics | 3 |
| Econ. 240—Labor Problems | 3 |
| Econ. 246—Economics of Trade Unionism | 3 |
| Econ. 248—Personnel Administration | 3 |
| Econ. 250—Money, Credit, and Banking | 3 |
| L.A. 274—Regional Planning | 3 |
| Mgmt. 301—Management in Manufacturing | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| Mktg. 211—Principles of Retailing | 3 |
| Mktg. 271—Salesmanship | 2 |
| Pol. Sci. 110—Government in Illinois | 2 |

[1] Students who present credit for a course in accounting and a course in elementary economics for entrance to the School of Journalism and Communications should choose electives or advanced social studies instead of Accy. 201 and Econ. 108.

| | |
|---|---|
| Pol. Sci. 305—Municipal Government | 3 |
| Pol. Sci. 306—Municipal Problems | 3 |
| Pol. Sci. 310—Rural Local Government | 3 |
| Pol. Sci. 351—American Constitutional System | 3 |
| Psych. 155—Social Psychology | 3 |
| Sociol. 100—Principles of Sociology | 3 |
| Sociol. 276—Sociology of the City | 3 |
| Sociol. 277—Rural Sociology | 3 |

## Radio Curriculum

*For the Degree of Bachelor of Science in Journalism*

The curriculum in radio journalism is designed to prepare students for all forms of radio work.

Students must complete eighteen hours in radio, including Journ. 261 (Principles of Broadcasting) and Journ. 368 (Radio Regulations). All radio students are required to take Journ. 211 (Reporting).

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of journalism electives for a total of thirty hours in required and elective journalism courses, and enough hours of general electives to meet the requirement of 124 hours for graduation.

A minimum of eighteen hours must be chosen from the radio courses listed below:

| | HOURS |
|---|---|
| Journ. 261—Principles of Broadcasting | 2 |
| Journ. 263—Radio Announcing | 2 |
| Journ. 264—Radio Acting | 2 |
| Journ. 265—Radio Continuity Writing | 2 |
| Journ. 266—Radio Dramatic Writing | 3 |
| Journ. 267—Radio Production and Direction | 3 |
| Journ. 362—Radio Station Management | 2 |
| Journ. 365—Radio News | 3 |
| Journ. 366-367—Advanced Radio Practices | 2 |
| Journ. 368—Radio Regulations | 2 |
| Journ. 386—Radio Advertising | 2 |

## MINOR IN HOME ECONOMICS FOR JOURNALISM MAJORS

For a minor in home economics the student must complete a minimum of twenty hours in home economics, including seven hours of required courses as indicated below:

| *Required Courses:* | HOURS |
|---|---|
| Home Econ. 120—Elementary Nutrition, or Home Econ. 130—Introduction to Foods and Nutrition | 2 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 271—Home Management | 2 |
| Electives | 13 |
| *Total* | 20 |

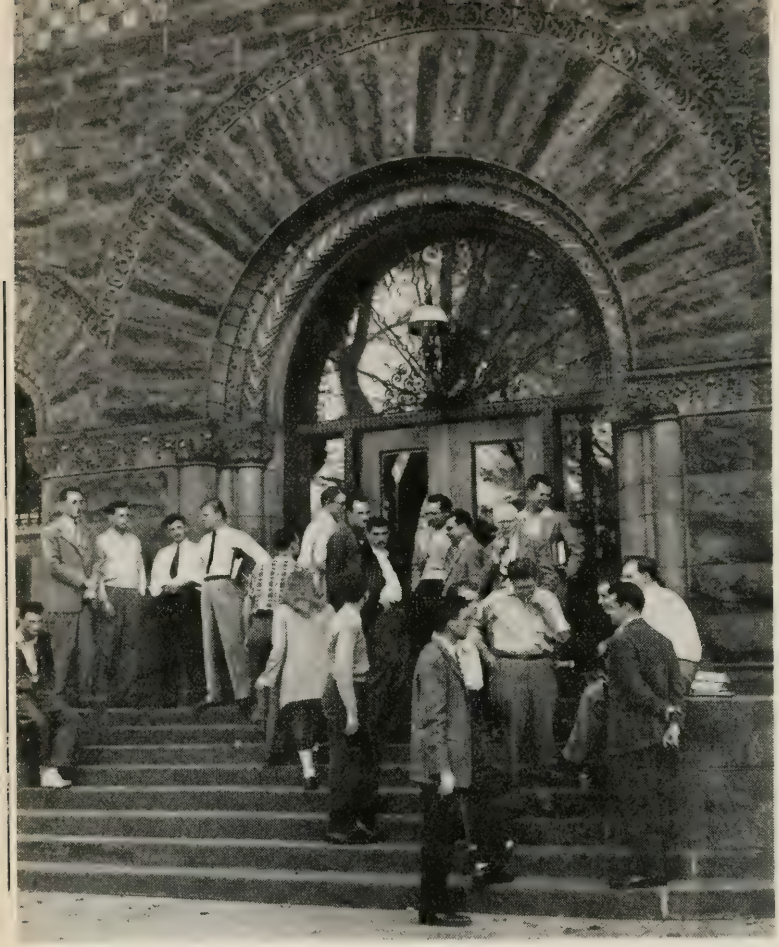
| *Electives:* | |
|---|---|
| Home Econ. 125—Introduction to Foods | 3 |
| Home Econ. 161—Family Housing | 3 |
| Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 190—Clothing Selection | 3 |
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 202—Laboratory in Child Development | 2 |
| Home Econ. 285—History of Costume | 2 |
| Home Econ. 395—Fashion Analysis | 3 |

## MINOR IN TEACHER TRAINING IN JOURNALISM FOR NON-JOURNALISM MAJORS

The teaching minor in the field of journalism requires a minimum of eighteen hours in journalism including the following courses:

| *Required Courses:* | HOURS |
|---|---|
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 212—Reporting Practice | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Journ. 308—High School Journalism | 3 |
| Journ. 321—Copyreading | 4 |
| *Recommended Courses for Additional Credit:* | |
| Journ. 215 and 216—Contemporary Affairs | 4 |
| Journ. 218—The Press and Public Opinion | 3 |
| Journ. 223—Press Photography | 3 |
| Journ. 227—Magazine Article Writing | 3 |
| Journ. 261—Principles of Broadcasting | 2 |

College of Law



Law Students Between Classes

Altgeld Hall

# College of Law

The primary purpose of the College of Law is to train men and women for the practice of law. Training for this purpose has proved its value also for those who become judges, legislators, and teachers of law and for administrators in government and in private business. The college aims to maintain a program which will prepare men and women for any of these callings, and which will assist them in becoming leaders in public thought and in community service.

The college conceives its responsibility as embracing much more than the learning of legal rules and formulas. It seeks to guide students in discriminating among the diverse sources of law, in appreciating the function of law in the social order, and in aiding the law to keep pace with changing conditions. It endeavors to inspire a consciousness of the lawyer's responsibility for the rational development and improvement of law in its substance and its administration.

Instruction in the College of Law is conducted by a faculty, all of whom have had substantial experience in private practice, government service, bar association activities, or a combination of these. They include authors of the nation's leading law textbooks, treatises, and casebooks, as well as numerous law review articles.

Most classes are conducted by the "case method." Broadly conceived, the case method involves the study of judicial decisions, statutes, and other sources of law, and the discussion and critical analysis of these materials by students under the guidance of members of the teaching staff. In advanced classes, increasing use is being made of exercises in drafting and research, and of seminars in which students may lead as well as follow in the discussion.

Courses are offered in wide variety. Beginning courses, dealing with basic problems in contract, tort, crime, and procedure, are required of all students. Intermediate and advanced courses are generally optional. Essential fields of practice, typified by trusts, evidence, and corporations, are thoroughly covered, and, in addition, students are offered a wide choice of specialized courses such as those in municipal corporations, oil and gas, and insurance. They may also take courses dealing with the origins and ends of law, such as the development of the common law, the legal profession, and jurisprudence.

## Requirements for Admission

The College of Law is compelled because of lack of space and facilities in classrooms and library to limit its enrollment. To meet this situation it has adopted the following scheme for the admission of students:

1. Applicants must file requests for admission on forms furnished by the college not less than sixty days before the opening of the term to which admission is sought. (New students, except transfers from other law schools, will not be admitted in the summer session.)

2. In selecting the persons to be admitted, preference will be given to applicants demonstrating the greatest ability, to veterans, and to residents of the state of Illinois.

**General Requirements.** Applicants to be eligible to apply for admission must have achieved a grade average of 3.5 in all college work taken and must meet the following requirements:

1. For admission to the four-year curriculum: The completion in residence of one-half the number of hours required for a bachelor's degree at the University or one-half the number of hours required for a bachelor's degree in a college approved by the University. (No new students will be admitted to the four-year curriculum after October 1, 1951.)

2. For admission to the three-year curriculum: Graduation from or senior standing in a college of the University or a college approved by the University.

**Transfers from Other Law Schools.** Students from law schools of approved standing who comply with the requirements for admission to this college may by transfer receive credit up to but not exceeding two years. The amount of credit given for work taken in another school depends upon the standards of the school and the grades the student has received.

## Prelegal Course

Students contemplating the study of law are advised to consult with the Student Counseling Bureau of the University relative to their interests and aptitudes for law, and with members of the law faculty in regard to their plans. The prelegal courses they take constitute a highly important phase of their education and should be planned with care.

Students taking the curriculum leading toward degrees in both liberal arts and law, or commerce and law, or agriculture and law, should comply with the major and minor and other requirements of the college in which their prelegal work is taken. Such students are urged to complete all of these requirements before entering the College of Law in order that they may devote their entire time to the first year of the law curriculum.

The prospective law student is advised to choose his work, beyond those subjects prescribed in the college in which he is registered, from among the following fields: English, with special emphasis on rhetoric and speech; political science; history, with emphasis on American and English constitutional history; economics; philosophy and particularly logic; Latin; psychology; sociology; mathematics; and accountancy.

It is essential that all students preparing for the study of law include accounting in their prelegal programs. They are advised also to include courses in the social sciences, and students carrying majors in other fields should take as much work as possible in the social sciences. Attention is also called to the fact that engineering and law, agriculture and law, and chemistry and law are very good combinations in the preparation they give for special fields of practice.

## Requirements for Graduation

The degree of Bachelor of Science in Law is conferred on students in the four-year curriculum who attain fifty-eight law credits with a weighted average grade of at least 3.0 in such of those credits as were obtained in courses taken in this University. A candidate for this degree must also meet the general requirements of the University as to military training, hygiene, physical education, and rhetoric.

The degree of Bachelor of Laws is conferred on students who secure a weighted average grade of at least 3.0 in credits obtained in law courses taken in this University, and who either study law for a period equal to three academic years in the three-year curriculum and obtain eighty-four hours of law credit, or 112 hours of law credit in the four-year curriculum.

In order to count resident study in full satisfaction of the time requirement, a student

must carry courses aggregating not less than ten hours a week each semester. Proportional credit toward the time requirement is awarded to students carrying less than ten hours a week.

The degree of Doctor of Law is granted to students who entered the College of Law before September 1, 1950, and who comply with the following conditions:

1. Secure the degree of Bachelor of Science in Law or a bachelor's degree in an approved undergraduate college.
2. Complete the work required for the degree of Bachelor of Laws.
3. Obtain a minimum average grade of 4.0 in the College of Law. If the grade is below 4.0, the degree conferred is Bachelor of Laws.

### Honors at Graduation

A student who has complied with the requirements for the degree of Bachelor of Science in Law, Bachelor of Laws, or Doctor of Law and who has attained in all work done in courses offered in the College of Law and presented for the degree the average grade specified below may be recommended for honors as follows: For an average grade of not less than 4.35, graduation with Honors; for an average grade of not less than 4.75, graduation with High Honors. The honors conferred shall be noted upon the diploma and the commencement program.

## Three-Year Curriculum in Law

### First Year (Required)

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Law 301—Contracts A | 3 | Law 302—Contracts B | 3 |
| Law 303—Torts A | 3 | Law 304—Torts B | 3 |
| Law 305—Judicial Remedies | 4 | Law 306—Agency and Employment | 3 |
| Law 307—Personal Property | 2 | Law 308—Estates in Land | 2 |
| Law 309—Criminal Law | 3 | Law 310—Constitutional Law | 4 |

## Four-Year Curriculum in Law

### First Year (Required)

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Law 301—Contracts A | 3 | Law 302—Contracts B | 3 |
| Law 303—Torts A | 3 | Law 304—Torts B | 3 |
| Law 305—Judicial Remedies | 4 | Law 310—Constitutional Law | 4 |
| Law 311—Development of the Common Law | 3 | Law 312—American Constitutional Development | 3 |
| Law 315—Legal Writing | 2 | Law 316—Legal Writing | 2 |

### Second Year

| | | | |
|---|---|---|---|
| Law 201—Accounting | 3 | Law 306—Agency and Employment | 3 |
| Law 309—Criminal Law | 3 | | |

## Both Curricula

### Advanced Courses (Optional)

After his first year, the student is permitted a choice of courses. In making his selection of courses in his second year, however, he should aim to lay a proper foundation for more advanced fields of study. To that end he will ordinarily elect in that year such courses as trusts, pleading, evidence, property (including titles and vendor and purchaser), business associations, administrative law, wills, bills and notes, and federal taxation.

The courses in international law and jurisprudence are recommended for advanced students in the four-year curriculum.

College of Liberal Arts and Sciences

Lincoln Hall

An Experiment in a Chemistry Laboratory

# College of Liberal Arts and Sciences

The College of Liberal Arts and Sciences serves several major purposes. It is the bearer of the old tradition of liberal education; it is a service unit for other colleges offering fixed curricula in pre-professional training; and it offers a number of programs leading to professional degrees.

**The General Curriculum.** The general curriculum in Liberal Arts and Sciences (page 176) requires a nucleus of courses in humanities, social sciences, biological sciences, and physical sciences; a reading knowledge of at least one foreign language; and a certain amount of concentration in the subjects chosen as majors and minors. Students in this curriculum are encouraged to develop interests and talents supplementing their major subjects and to take courses with cultural values such as art, literature, music, and others listed as electives.

All students planning for more advanced study after graduation, especially if they hope to engage in research, are encouraged to arrange their programs with reference to the requirements for admission to the Graduate College. Provision has been made for those who wish to prepare themselves for various professions and vocations.

**Division of General Studies.** The Division of General Studies provides a unified two-year program of basic courses. The primary aim is a liberal education to insure a well-balanced personal development with an understanding of the forces, tendencies, and conflicts of the present age in the light of the intellectual and cultural heritage of the past. (See page 175.)

**Chemistry and Chemical Engineering.** Chemistry may be taken as a major subject in the general curriculum, as a minor subject, or as an elective independent of the major and minor subjects. For more specialized training, however, separate curricula are offered in chemistry and in chemical engineering (page 183), the latter requiring certain fundamental courses in several departments of the College of Engineering.

**Home Economics.** Students desiring to specialize in home economics may make it their major subject in the general curriculum of this college as an alternative to the curricula in home economics offered by the College of Agriculture (page 63) and the College of Education (page 94). Certain courses in home economics may be elected by students not specializing in that subject.

**American Civilization, International Affairs, Latin American Studies, and Medieval Civilization.** These curricula are cooperative interdepartmental programs. They may be used as interdepartmental majors or minors as shown in the curriculum descriptions. (See pages 180-183.)

**Occupational Therapy.** The occupational therapy curriculum consists

of six semesters of work on the Urbana campus and five terms at the College of Medicine on the Chicago campus. Upon satisfactory completion of the work of this curriculum, the student is eligible for the degree of Bachelor of Science in Occupational Therapy from the College of Medicine. Students who wish to have the benefit of a more liberal education than is afforded by the minimum requirements in this curriculum may complete the work for a bachelor's degree in the College of Liberal Arts and Sciences before making application for admission to the professional work at the College of Medicine. For the six-semester curriculum on the Urbana campus, see page 191.

**Predentistry.** The minimum requirements for admission to the College of Dentistry may be met by students who complete two years of work identical with the first two years of the premedical curriculum (page 187). Students planning to study dentistry may register as predental freshmen and sophomores with special advisers, or may follow the general curriculum of liberal arts and sciences for more than two years in order to obtain not only the necessary basic courses in the natural sciences but also to have opportunity for some courses in the humanities.

**Prejournalism.** Students preparing for journalism as a profession are advised to take two years of work in the general curriculum of liberal arts and sciences or the curriculum of the Division of General Studies, selecting fundamental courses which will admit them to the School of Journalism and Communications (page 158).

**Prelaw.** Students preparing for the study of law ordinarily complete the first three years of the general curriculum in liberal arts and sciences or the program of the Division of General Studies before entering the College of Law (page 166). During their senior year they may, if scholastically qualified, elect courses equivalent to the first year of work in that college, and thus complete the requirements for graduation from this college while making progress toward a degree in law.

**Premedicine.** Students intending to study medicine may first complete the four-year general curriculum in liberal arts and sciences, with major and minor subjects chosen from the physical and biological sciences, and thus have the benefit of a more liberal education than is afforded by the minimum requirements for admission to the College of Medicine. Those who wish to enter the College of Medicine after three years of undergraduate work may enroll, if scholastically qualified, in the premedical curriculum outlined on page 188.

**Prenursing.** The prenursing curriculum is a two-year program designed to prepare students for a degree program in nursing at one of the four affiliated hospitals in Chicago. It consists of a minimum of sixty semester hours of required and elective subjects. (See page 189.)

**Preveterinary.** The preveterinary curriculum is a two-year program designed to prepare students for admission to the College of Veterinary

Medicine. It consists of a minimum of sixty semester hours of required and elective subjects. (See page 190.)

**Teacher Training.** Prospective teachers who are registered in the College of Liberal Arts and Sciences should register in one of the teacher-training curricula and indicate their choice of teaching field so that they may have their study program approved by one of the special advisers in the chosen field. Satisfactory completion of one of these curricula meets in full the course requirements of the state law for certification of teachers.

**Individual Curricula and Tutorial Work.** For superior students who have had at least one year of undergraduate work in residence at the University, individual curricula may be arranged to serve other purposes than those accomplished by the established curricula. Opportunities for independent study under the guidance of faculty members, supplementing the classroom instruction, are available under the tutorial system (page 174).

**Transfers.** Students transferring from other colleges are welcomed if they give satisfactory evidence of their ability to succeed in this college. Students in this college are free to transfer at any time to other colleges, or from one curriculum to another within this college, if they are properly qualified.

## Departments and Divisions

To correlate the work of departments in the College of Liberal Arts and Sciences, the following groups are organized:

1. The Division of Biological Sciences, consisting of Bacteriology, Botany, Entomology, Physiology, Psychology, and Zoology.
2. The Division of Humanities, consisting of the Classics, English (including Rhetoric), French, German, Philosophy, Spanish and Italian (including Portuguese), and Speech.
3. The Division of Social Sciences, consisting of Economics (a department in the College of Commerce), Geography, History, Philosophy, Political Science, Psychology, Sociology, and Anthropology, and courses in Social Welfare Administration (an independent division).
4. The departments of the physical sciences are Astronomy, Chemistry (including Chemical Engineering), Geology, and Mathematics.

Graduate as well as undergraduate work is conducted in all departments of this college, and courses in all these departments are taken by students enrolled in other colleges and schools of the University. The work of the faculty of this college thus serves all curricula that include the humanities, natural sciences, and social sciences.

## Individual Curricula

A limited number of sufficiently gifted and mature students may make arrangements for individual curricula, the satisfactory completion of which will lead to the degree of Bachelor of Arts or Bachelor of Science. The main purpose of such curricula is to serve the needs of superior students who can profit more from individual programs of studies than from any of the established programs. In general, the following regulations govern the operation of individual curricula.

1. A student may make application to the Dean of the College for admission to an individual curriculum after the completion of at least twenty-seven semester hours in residence at the University with an average of at least 4.0.
2. The acceptance of a student for registration in an individual curriculum requires the approval of the college and of the major department concerned.
3. Each candidate must meet the general University requirements with respect to reg-

istration, residence, fees, hygiene, military training, physical education, and rhetoric, and obtain credit in approved courses totaling at least 120 semester hours.

4. Having once been admitted to an individual curriculum, a student must maintain an average grade of at least 3.5, or be transferred to one of the established curricula.

## Tutorial Work

Under the tutorial system, students in the College of Liberal Arts and Sciences have opportunities for independent study and investigation. Before beginning tutorial work, a student must ordinarily have completed Groups A and B of the requirements for the general curriculum or the freshman-sophomore program of the Division of General Studies; have attained junior standing with at least a 4.0 academic average in work taken at the University (exclusive of courses in military and physical education); and have given promise of being able to do independent work in the proposed field of investigation. Applications are subject to approval by the department concerned and by the Dean of the College, and should ordinarily be filed before the close of the sophomore year. In the case of departments in which required sequential courses extend through the junior year, applications may be deferred until the beginning of the senior year.

Students whose applications are accepted will register for tutorial work. Such students should normally register for sixteen hours of credit in any one semester, of which not more than twelve hours may be in formal class work. However, it is permissible to leave undetermined the number of hours of credit in tutorial work until the close of the semester. In such cases, the amount of credit is determined by the Dean on recommendation of the tutor and the department concerned.

## Honors at Graduation

At graduation, honors are awarded to students on the basis of superior quality of scholarship.

A student is considered eligible for graduation with honors who, after having attained junior or higher standing, has earned fifty-six or more semester hours in the University which count toward graduation from this college, and who has fulfilled all other graduation and honors conditions.

While earning credit to be presented for honors, a student must carry at least twelve semester hours of academic work (exclusive of military, physical education, or hygiene) each semester.

Honors are awarded and graded according to the following rules:

1. All candidates for honors must present an acceptable thesis or pass a comprehensive examination based on a course of study approved by the department of specialization or another competent body. The thesis course or special course of study must carry credit for not less than four semester hours. It is recommended that the student spend two semesters on the thesis or honors course, taking it for at least two semester hours of credit each semester.

2. For the degree with Honors, the student must be recommended for Honors by his department of specialization, and have earned an average of 4.0 in all courses counted toward graduation from this college.

3. For the degree with High Honors, a student must be recommended for High Honors by his department, and have earned an average of 4.25 in all courses counted toward graduation from this college. The thesis or comprehensive examination must give evidence of unusual ability.

4. For the degree with Highest Honors, a student must be recommended for Highest Honors by his department, and have earned an average of 4.5 in all courses counted toward graduation from this college. The thesis or comprehensive examination must give evidence of exceptional ability.

For graduation with honors, the notation on the diploma reads: Honors in .....; High Honors in .....; Highest Honors in ..... (The name of the student's subject or subjects of specialization is added.) Such honors are recommended by the head of the department of specialization and are subject to the approval of the Dean of the College.

**Honors in Tutorial Work.** The honors to be awarded at graduation to superior students upon completion of their tutorial work are designated as Tutorial Honors, High

Tutorial Honors, and Highest Tutorial Honors. They are awarded and graded solely on the basis of the general examination given at the close of the tutorial course. For graduation with honors in tutorial work, the notation on the diploma reads: Tutorial Honors in .....; High Tutorial Honors in .....; Highest Tutorial Honors in ..... (The name of the student's subject or subjects of specialization is added.) Such honors are recommended by the head of the department of specialization and are subject to the approval of the Dean of the College.

## Curriculum in the Division of General Studies

The Division of General Studies offers a two-year program at the end of which a student may transfer his credit into other curricula of the College of Liberal Arts and Sciences or into the curricula of other colleges; or may bring his formal university career to a temporary or final close. In the latter case, if he so desires and if he has fulfilled successfully all requirements, the student will be awarded the Certificate of Associate in Arts.

### General Courses

The work of this curriculum is based on seven general courses, one in each of the following fields: (1) verbal communication, (2) history of civilization, (3) biological science, (4) physical science, (5) social science, (6) literature and the fine arts, (7) philosophy and psychology. Each course extends through two semesters and gives eight semester hours of credit toward graduation. The student receives grades at the end of each semester.

In all these courses the general purpose is the introduction of the student to the points of view and methods of exploration characteristic of each field, to enable him to discover and make use of its resources for individual and social living. These courses are planned to supplement and support one another.

All members of the teaching faculty who conduct these courses are of the rank of instructor or above. Each discussion class is limited to twenty students, so that every student can receive individual instruction and participate in the general exchange of views within the class as a group.

Each student normally completes three of these general courses in his freshman year and three more of them in his sophomore year. At least six of the seven, including the first four listed above, should be completed by the end of the sophomore year.

Most of the required courses in the Division of General Studies, listed below, are accepted as fulfilling the prerequisites for advanced courses offered by other departments of the University.

**First Year**

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 111—Verbal Communication | 4 | D.G.S. 112—Verbal Communication | 4 |
| D.G.S. 121—History of Civilization | 4 | D.G.S. 122—History of Civilization | 4 |
| D.G.S. 131—Biological Science, or D.G.S. 141—Physical Science | 4 | D.G.S. 132—Biological Science, or D.G.S. 142—Physical Science | 4 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| Electives[1] | 2 to 4 | Military (men) | 1 |
| | | Electives[1] | 2 to 4 |
| *Total* | 14 to 16 | *Total* | 16 to 18 |

[1] An elective is not required in a minimum schedule, but most students will wish to elect another course. A foreign language is recommended, especially for students who plan to continue in the College of Liberal Arts and Sciences for a bachelor's degree. Mathematics is also recommended, especially for students who may be going into technical work.

**Second Year**

| | | | |
|---|---|---|---|
| D.G.S. 131—Biological Science, or D.G.S. 141—Physical Science | 4 | D.G.S. 132—Biological Science, or D.G.S. 142—Physical Science | 4 |
| Two of the Following: | | Two of the Following: | |
| D.G.S. 151—Social Science | 4 | D.G.S. 152—Social Science | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 | D.G.S. 162—Literature and Fine Arts | 4 |
| Psych. 100—Introduction to Psychology | 4 | Phil. 101—Introduction to Philosophy | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives[1] | 2 to 4 | Electives[1] | 2 to 5 |
| *Total* | 14 to 16 | *Total* | 14 to 16 |

Students from outside the Division of General Studies may elect one or more of the seven courses and will receive full credit for each semester successfully completed.

### Transferring to Other Curricula

If at the end of the second year in the Division of General Studies a student transfers to the general curriculum in the College of Liberal Arts and Sciences, he must satisfy the foreign language requirement of the college (see page 177). If he has successfully completed six of the seven courses in the Division, he will have fulfilled the new general education requirements of the college.

The two-year program of the Division of General Studies is highly recommended as a preparation for the professional curricula in the College of Law (four-year curriculum), the School of Journalism and Communications, the College of Education, and the Library School, which require junior standing in the University for admission.

## General Curriculum in Liberal Arts and Sciences

*For the Certificate of Associate in Arts*

Students in the liberal arts and specialized curricula who have satisfactorily met the basic knowledge and general education requirements of the liberal arts curriculum and the general University requirements in rhetoric, hygiene, military, and physical education, and who have satisfactorily completed sixty hours of academic work shall, upon application, be awarded the certificate of Associate in Arts.

*For the Degree of Bachelor of Arts or Bachelor of Science*

Because of the wide range of courses open to students in the general curriculum of liberal arts and sciences, it is not feasible to specify the definite sequences of courses to be taken by any student in each of the four years of this curriculum. Under the guidance of advisers, each student is expected to plan his own program within the general requirements outlined below. This general outline indicates the ordinary procedure in fulfilling the requirements for the degree of Bachelor of Arts, or for the optional degree of Bachelor of Science.

### Requirements for Graduation

Each candidate for the degree of Bachelor of Arts or Bachelor of Science in the general curriculum of liberal arts and sciences must meet the general University requirements with respect to registration, residence, fees, hygiene, military training, physical education, and rhetoric. He must also obtain credit, with a satisfactory scholastic average, in approved courses totaling at least 120 semester hours, not counting credit earned for the first two years of work in military training and physical education. In securing this credit, each

[1] An elective is not required in a minimum schedule, but most students will wish to elect another course. A foreign language is recommended, especially for students who plan to continue in the College of Liberal Arts and Sciences for a bachelor's degree. Mathematics is also recommended, especially for students who may be going into technical work.

candidate must have an average of not less than 3.0 in all grades received, including grades in courses transferred from other institutions, and excluding those received in the first two years of work in physical education and military training. (The grades received in advanced military training are used in computing the average.) He must not have grades below "C" in more than one-fourth of the total number of semester hours earned. In computing the grade-point average, weighted values are given to the grades as follows: "A" = 5 grade points; "B" = 4; "C" = 3; "D" = 2; "E" (failure) = 1. The individual grades are multiplied by the respective number of semester hours which each represents, and the sum of these products is divided by the total number of semester hours taken.

**Optional Degree of Bachelor of Science.** Majors in the physical and biological sciences, home economics, and psychology may receive the degree of Bachelor of Science. The degree desired must be indicated on the authorization card at the time of registration for the last semester of work.

## Prescribed Subjects

To be begun in the first semester of the freshman year, except as otherwise provided, and to be continued until the requirements are completed.

1. *Hygiene.* One semester, not more than two hours. Credit may be obtained by a proficiency examination.
2. *Physical Education.* Four semesters.
3. *Military Training (men).* Four semesters.
4. *Rhetoric.* Two semesters (Rhet. 101 and 102). The quality of work acceptable in the fulfillment of this requirement must satisfy the general University regulations concerning rhetoric which are found on page 24. This requirement may be satisfied by foreign students if they pass Rhet. 114 and 115.
5. *Foreign Language.* A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, Russian, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104 or 105, Portuguese 104, Russian 204, Spanish 104, or a more advanced course in any of these languages. Completion of four years of one of these languages in high school also satisfies this requirement. Proficiency examinations are offered in all these courses as well as in the more elementary courses in languages.

NOTE: No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. (Students planning to enter the Graduate College are advised to obtain a reading knowledge of both French and German.)

6. *Basic Knowledge.* Students who enter the general curriculum in liberal arts and sciences as freshmen (or who enter other schools and subsequently transfer to the college) and who lack one unit of American history in high school must take Hist. 151 and 152; and those who lack two units of high school credit in mathematics—one unit in algebra and one unit in plane geometry—must take Math. 101 and 102.

## General Education Sequences

Students who enter the general curriculum (or who enter other schools and subsequently transfer to the college) are required to complete at least an eight-semester-hour sequence in each of these areas: (a) humanities, (b) biological science, (c) physical science, and (d) social science.

The following regulations apply to the foregoing sequences:

1. Students should complete at least one of these sequences during the first year of study.
2. Students with sophomore standing should complete at least one additional sequence during the second year.
3. Some of the sequences are at the advanced level and require at least junior standing. Such courses will count toward advanced hours required for graduation.
4. A student need not satisfy a sequence in the area in which the major department is classified. For example, if the major is chemistry, the student does not take a general education sequence in the physical sciences. If the major is English, then no other sequence is required in the humanities. The same is true for other areas. Consequently, freshmen should enroll in a sequence which will not duplicate the intended major, and

final decision on the major field should be made at the beginning of the sophomore year if possible.

5. In so far as possible, the sequences should be chosen from courses approved by the college. Authority for substitutions in the sequence requirements must be obtained from one of the deans. The following have been approved:

*Biological Science*

Bot. 100, Zool. 104
D.G.S. 131, 132
Entom. 103, Bot. 100
Entom. 103, Zool. 104
Physiol. 103, Psych. 103

*Humanities*

Classics 103, 106, and 101 or 110
D.G.S. 161, 162
Engl. 101, 102, 103
Engl. 121, 122
Engl. 253, 363, 364
Humanities 211, 212
Phil. 101, 102, 105
Phil. 303, 306

*Physical Science*

An approved sequence of eight hours chosen from astronomy, chemistry, geography, mathematics, and physics
D.G.S. 141, 142
Geog. 101, 111
Geol. 101, 102

*Social Science*

D.G.S. 121, 122
D.G.S. 151, 152
Geog. 101, 104
Hist. 111, 112
Phil. 103, 104
Pol. Sci. 101, 102
Psych. 105, 106
Sociol. 104, 105

A student may not use more than one sequence from any one department to satisfy the general education requirements.

NOTE: Any student who has completed the six courses prescribed by the Division of General Studies will have satisfied all of the general education sequence requirements in the general curriculum.

## Majors, Minors, and Advanced Courses

1. *Major Subjects.* Each student before beginning the junior year selects one subject and declares it to be his major. In order to be acceptable for graduation, a major must consist of at least twenty hours in courses chosen from those designated by a department and approved by the faculty of the college. Such courses are to be inclusive of some distinctly advanced work and exclusive of courses open to freshmen. At least five hours of the work acceptable for a major must be done in residence at the University.

The subjects recognized as majors in this college are: bacteriology, botany, chemistry, classics, economics, English, entomology, French, geography, geology, German, Greek, history, history of art, home economics, Italian, Latin, mathematics, music, philosophy, physics, physiology, political science, psychology, sociology and anthropology, Spanish, speech, zoology.

2. *Minor Subjects.* Each candidate for graduation must offer, in addition to his major, a minor consisting of twenty hours in one or two subjects designated by the department in which he is taking his major and approved by the faculty, with at least eight hours in each subject if two are chosen.

3. *Interdepartmental Majors and Minors.* The curricula in American civilization, international affairs, Latin American studies, and medieval civilization may be used as majors, or as minors with a major in certain departments. The details of these curricula and the departments with which they may be used as majors or as minors are shown on pages 180-183.

4. *Advanced Courses.* Thirty hours of the work taken in the junior and senior years must be in courses not ordinarily open to freshmen or sophomores. Students should plan their first and second years of work so as to include the prerequisites for advanced courses. (Advanced courses are numbered 200 or 300 with the exception of Rhet. 200.)

## Electives

1. *Liberal Arts and Sciences.* Any course offered in the College of Liberal Arts and Sciences may be used as an elective.

2. *Other Colleges.* Electives totaling as much as but not more than thirty-two hours may be taken in other colleges and schools of the University and counted toward graduation from this college, in addition to the courses acceptable for major and minor requirements, if such electives are in conformity with the following list approved by the faculty:

*Accountancy.* A total of 6 hours including not more than one of the following courses: Accy. 101, 102, or 201.

*Agricultural Economics.* A total of 6 hours.

*Architecture.* A total of 15 hours.

*Art.* A total of 15 hours, unless the student is majoring in history of art.

*Aviation.* A total of 6 hours.

*Business Law.* A total of 6 hours.

*Economics.* All courses.

*Education.* A total of 20 hours.

*Engineering.* A total of 10 hours.

*Forestry.* A total of 3 hours.

*Home Economics.* All courses.

*Horticulture.* A total of 6 hours.

*Hygiene.* Hygiene 101 (2 hours).

*Journalism.* A total of 10 hours.

*Landscape Architecture.* A total of 7 hours.

*Law.* A student of senior standing with an average of 3.5 who has been in residence either the first two years or the last year of his prelegal work may take and count toward the A.B. degree not more than 32 hours in the College of Law, provided that not less than two courses amounting to at least 5 hours a semester are taken, with the advice of the Dean of the College of Law, and provided further that if any such student desires to take more than 6 hours of law work he must also register in the College of Law.

*Library Science.* A total of 20 hours.

*Management and Marketing.* A total of 6 hours. Typewriting, secretarial training, and shorthand may not be counted for credit.

*Military Training.* A total of 8 hours in advanced courses.

*Music.* A total of 15 hours approved by the Director of the School, unless the student is majoring in music.

*Physics.* All courses.

*Religious Foundation Courses.* A total of 10 hours. Not open to freshmen or to students on probation.

*Graduate Courses.* A student of excellent standing who is within 5 semester hours of his bachelor's degree may be given the privilege of electing courses in the Graduate College with the consent of the Dean of that College. Such a student will register in both the College of Liberal Arts and Sciences and the Graduate College.

## Majors Outside the College

1. *Economics*

Major: In addition to Econ. 102 and 103, or Econ. 108 and 109, twenty hours of courses in economics for which Econ. 102 or 108 is a prerequisite, including Econ. 200 and two other courses chosen from the following: 210, 214, 216, 218, 224, 226, 228, 238, 239, 240, 246, 248, 250, 251, 254, 257, 260, 262, 272, 280, 288, 290, 291, 292, 293, 306, 312, 315, 328, 336 (the prerequisite of Econ. 102 or 108 is waived for this course), 342, 378, 379, 380, 384, 390, 391.

L.A.S. majors in economics are advised strongly to elect Econ. 171 and Accy. 201. Econ. 171 is acceptable toward the twenty-hour major, but Accy. 201 is not acceptable toward the major requirement.

Minors: Twenty hours in any one or two of the following subjects: geography, geology, history, mathematics, philosophy, political science, psychology, social welfare administration, sociology and anthropology. At least eight hours must be taken in each subject, if two are chosen. The curriculum on international affairs will be accepted as a minor, and also the program in Latin American studies.

2. *History of Art*

Major: Twenty hours in art, excluding Art 185 and 186. The major must include Art 111, 112, 188, and 189, and at least ten hours chosen from Art 311, 312, 313, 314, 315, 316, 317, 318.

Minor: Twenty hours in any one or two of the subjects which follow: English, Greek, history, Latin, philosophy, psychology, sociology and anthropology, and speech. At least eight hours must be taken in each subject if two are chosen. The minor may also be taken in the curriculum in medieval civilization or the curriculum in Latin American studies.

3. *Home Economics*

Major: Twenty hours as specified in Groups II and III, on page 64. (The courses specified in Group I are required, although they are not counted toward the major. The following courses are also required: Art 185; Chem. 101 or 102, and 132 or 133; Econ. 108; Psych. 100 or 103; Sociol. 100; at least six hours in English literature; and at least eight hours in bacteriology and physiology. Some of these required courses may be counted in Minor A or Minor B as shown below.)

Minor A: Twenty hours chosen from one or two of the following subjects: Bacteriology, chemistry. At least eight hours must be taken in each subject if two are chosen.

Minor B: Twenty hours chosen from one or two of the following subjects: economics, psychology, sociology. At least eight hours must be taken in each subject if two are chosen.

4. *Music*

Major: Thirty-two hours in music including the following: Music 102, 103, 106, 107, 226, and 227; two hours of Music 246; four hours of applied music (Music 160-177); six hours of electives in advanced music history. Students unable to pass the qualifying examination required for registration in Music 102 must take Music 100 in excess of graduation requirements.

The qualifying examination in piano given at the time of entrance presumes a moderate degree of proficiency (scales, simple composition, and sight reading, together with an adequate keyboard technique). Students unable to meet this proficiency must satisfy this requirement in excess of curriculum requirements in applied music.

Minor: Twenty hours in one or two subjects chosen from the following list: history, languages, language and literature, philosophy, physics, physiology, psychology, sociology and anthropology. At least eight hours must be taken in each subject if two are chosen.

# INTERDEPARTMENTAL PROGRAMS

## Curriculum in American Civilization

This curriculum is sponsored by the Division of Humanities.

I. *For Students Majoring in American Civilization*

*Major:* Students who elect American civilization as a major shall complete forty semester hours (which satisfies both major and minor requirements for graduation) in courses indicated below, at least twenty hours being in courses numbered 300 or above. They are required to maintain a 3.0 general average at all times; that is, when the average drops below that level the student shall drop from this major. Specifically required are:

1. Engl. 113, 114, Hist. 151, 152, and either Art 317 or Phil. 313 (a total of fifteen hours). Equivalent or more advanced courses may be substituted provided that, taken together, they constitute comprehensive surveys of the three fields of American history, American literature, and either American art or American philosophy. Approval for any such substitution must be requested by a petition to the Dean bearing the recommendation of the adviser for the curriculum.

2. At least six hours of advanced work in history and at least six hours of advanced work in English, chosen from the following courses all of which are in the American field: Engl. 144, 283, 284, 285, 286, 315, 316, 353, 354, 375; Hist. 335, 336, 352, 353, 354, 357, 358, 359, 361, 362, 363, 364, 369, 370, 371, 372, 373, 374. Speech 366 may be substituted for Engl. 315, 316.

3. At least six hours from the following courses: Arch. 217, 218; Econ. 336; Ed. 302; Geog. 221, 222; Pol. Sci. 150, 151, 351, 381, 397; Speech 312; or courses listed in the preceding paragraphs, if not counted toward the requirements thereunder.

4. At least six additional hours in one of the following departments: Art, English, History, Philosophy, or Political Science, chosen from courses which deal with non-American aspects of the subject but which are closely related to specific courses selected under the preceding requirements, such as, for example, a course dealing with the same period in European history or in English literature. The committee in charge of the curriculum will advise with each student concerning these additional hours, will assume responsibility for the student's registration in the proper courses, and will file a record

of the student's registration indicating the specific courses approved as satisfying this paragraph in the office of the College of Liberal Arts and Sciences.

II. *For Students Whose Minor Is American Civilization*

This curriculum has been approved as a minor for students majoring in geography, history, political science, and speech. A split minor is not authorized. No course counted toward the student's major may be counted toward the minor. The minor consists of at least twenty semester hours, including the required courses Hist. 151-152 and Engl. 113-114, and in addition:

1. At least three hours from courses listed under (2) of the requirements for the major in American civilization, excluding those numbered under 300 and excluding those in the department in which the student is majoring.

2. The remainder, if any, chosen from courses listed under (1) and (3) of the requirements for the major in American civilization, excluding those numbered under 300 and excluding those in the department in which the student is majoring.

## Curriculum in International Affairs

This curriculum is sponsored by the Division of Social Sciences.

I. *For Students Majoring in International Affairs*

*Major:* Students who elect international affairs as a major shall complete forty semester hours (which satisfies both major and minor requirements for graduation) including:

1. The following prescribed courses: Econ. 226, Geog. 104, Hist. 112, Phil. 311 or 336, Pol. Sci. 371, Soc. Sci. 282, Sociol. 327, and if the student becomes a candidate for honors, Soc. Sci. 292.

2. The remaining courses from not less than two departments with at least nine hours in some one department over and above the prescribed courses chosen from the following:

Agr. Econ. 111, 201
Econ. 210, 218, 226, 228, 239, 250, 251, 346
Ed. 200
Geog. 101, 103, 104, 231, 232, 342, 351, 363, 365
Hist. 313, 314, 317, 318, 339, 340, 376, 377, 378, 391, 392
Journ. 310
Min. E. 302
Phil. 103, 104, 311, 321, 336
Pol. Sci. 331, 336, 342, 343, 371, 372, 373, 384, 385, 386, 396
Psych. 155
Soc. Sci. 101, 102, 282, 292
Sociol. 100, 288, 327, 344, 347, 378

*Minor:* The forty hours of courses required in this program satisfy both major and minor requirements for graduation.

Students who elect the above major are required to maintain a 3.5 general average at all times; that is, when the average drops below that level the student shall drop from this major.

Students are strongly urged to gain a sound working knowledge of one modern foreign language. Each student is advised to take courses from the list designed to give a better understanding of an area within the general field of international affairs. For example, he may concentrate in international economic relations, international organization, regional areas, or other features of the broad field. The courses required are intended to delineate the major underlying principles of international affairs rather than to provide detailed knowledge. The latter should be gained from the selection of courses over and above the minimum list under the guidance of the adviser and administrative committee designated by the Division of Social Sciences. Finally, the student is encouraged to take courses carrying advanced credit hours.

II. *For Students Whose Minor Is International Affairs*

Students may use international affairs as a minor if the major field is economics, geography, history, philosophy, political science, or sociology and anthropology. The

minor consists of at least twenty semester hours including the required courses: Econ. 218, Pol. Sci. 371 or 372, Sociol. 327 or 317, and at least two courses in each of Groups I and II.

GROUP I: Econ. 210, 226; Hist. 313 (or 314), 392; Phil. 103, 104; Pol. Sci. 396.

GROUP II. Agr. Econ. 111, 201; Econ. 228, 238, 250; Ed. 200; Geog. 101, 103, 104, 342, 351, 363, 365; Hist. 111, 112, 310, 318, 320, 343; Journ. 310; Min. E. 302; Phil. 311 or 336; Pol. Sci. 331, 336, 337, 381, 384, 385, or 386; Psych. 155; Soc. Sci. 101 or 102; Sociol. 270, 288, 344.

## Curriculum in Latin American Studies

This curriculum is sponsored by the Division of Social Sciences.

I. *For Students Majoring in Latin American Studies*

*Major:* Students who elect Latin American studies as a major shall be required to

(1) Complete the prescribed and general education sequences required in the general curriculum.

(2) Complete six semesters or equivalent of college Spanish or Portuguese. (In the case of well-qualified students, the language requirement for this major may be modified.)

(3) Complete at least twenty-four semester hours, including Soc. Sci. 101, 102, or both; and the remaining hours chosen from four departments among the following: Agr. Econ. 111; Anthrop. 251, 261; Art 318; Biol. Sci. 100; Econ. 328; Geog. 231, 232; Hist. 322, 375, 376, 377, 378; Pol. Sci. 342, 343.

*Minor:* Students who major in Latin American studies may elect minors as follows: twenty hours (excluding courses taken in the freshman year) in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: agricultural economics, economics, geography, history, philosophy, political science, Portuguese, social welfare administration, sociology, and Spanish.

II. *For Students Whose Minor Is Latin American Studies*

This curriculum has been approved as a minor for students majoring in economics, geography, history, philosophy, political science, sociology, and Spanish. Students who elect Latin American studies as a minor shall be required to

(1) Complete four semesters or equivalent of college Spanish or Portuguese.

(2) Complete at least twenty-four semester hours chosen from the approved courses as listed above and including Soc. Sci. 101, 102, or both; and courses from at least three departments in the curriculum exclusive of courses used in the major department.

*Split Minor:* Students may split the minor with other departments, but must take at least twelve semester hours from Latin American studies, including Soc. Sci. 101 or 102, and courses from at least two departments in the curriculum, exclusive of courses which may have been used for the major.

Science and engineering students who have full curricula of their own and who can not possibly major or minor in the above curriculum, may take many of the courses without formal prerequisites.

## Curriculum in Medieval Civilization

This curriculum is sponsored by the Division of Humanities and may be elected as a major, or as a minor for students majoring in one of the following departments: Classics, English, French, German, History, Philosophy, Political Science, Sociology and Anthropology, Spanish and Italian, or Speech.

*Major:* The major consists of twenty hours as follows:

GROUP I: Twelve hours in Engl. 313, 314; Hist. 301, 302.

GROUP II: Eight hours to be selected from among the following: Engl. 311; Hist. 304, 333, 345; Phil. 304; Italian 311, 312; Arch. 215, 216; Art 312.

GROUP III: If any course in Group I, in whole or in part, is chosen to count toward a major or minor in English or in history, respectively, the adviser may approve election of a course or courses in Group III to the extent of a corresponding number of hours in either Classics 103 or 106, or Latin 104 or 105, Phil. 336, and Speech 361.

*Minor:* As a rule, students choosing medieval civilization as a major will be expected to choose a minor in one of the following departments: Classics, English, French, German, History, Philosophy, Political Science, Sociology and Anthropology, Spanish and Italian, or Speech.

# SPECIALIZED CURRICULA

## Chemistry and Chemical Engineering

The following curricula in chemistry and chemical engineering afford more specialized training than is required of students who make chemistry their major subject in the general curriculum of liberal arts and sciences.

The minimum language requirement for graduation in these curricula is the equivalent of two years of college work in German or French, or one year in each. A student who has had two years of French or German in high school should study the other language in the University. (Russian may be substituted for French.) When a student does not offer either German or French for entrance, the second year of the language required for graduation may be counted as an elective in the chemistry curriculum. Students entering with two units of credit for German or French (two units in high school being equivalent to one year in college) should complete this minimum requirement in their freshman year. Those entering with less than two units in German or French should complete this requirement in their sophomore year or as early as possible.

An optional four-year curriculum in chemical engineering is available for students who are especially interested in the field of industrial fermentation, pharmaceutical, and biochemical manufacturing industries. Students who enter without adequate preparation in chemistry, mathematics, and languages will find it difficult to complete either of the curricula in chemical engineering in four years. An optional five-year program is available and is recommended especially for those who plan on seeking positions in sales, technical service, and administration in the chemical industry, and who wish to broaden their technical training through courses in the humanities, economics, and labor and business administration. All three curricula lead to the degree of Bachelor of Science in Chemical Engineering.

Students should note that they must have a 3.5 general average for registration in these curricula after they have attained junior standing.

## Curriculum in Chemistry

*For the Degree of Bachelor of Science in Chemistry*

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis[1] | 5 | Chem. 108—General Chemistry and Qualitative Analysis | 5 |
| German or French | 4 | German or French | 4 |
| Math. 117—Combined Freshman Mathematics[2] | 5 | Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition | 3 | Math. 127—Combined Freshman Mathematics[2] | 4 |
| Physical Education | 1 | Rhet. 102—Rhetoric and Composition | 3 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 17 | *Total* | 18 |

[1] All students with entrance credit in chemistry are required to take a proficiency examination before registering for Chem. 107. Those who do not show the necessary proficiency will be placed

## Second Year

| | | | |
|---|---|---|---|
| Chem. 124—Quantitative Analysis | 5 | Chem. 234—Organic Chemistry | 5 |
| Math. 137—Calculus | 3 | Math. 147—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives[3] | 3 | Electives[3] | 2 |
| *Total* | 16 | *Total* | 15 |

## Third Year

| | | | |
|---|---|---|---|
| Chem. 240—Elementary Physical Chemistry | 3 | Chem. 294—Chemical Literature and Reference Work | 1 |
| Chem. 241—Elementary Physical Chemistry Laboratory | 1 | Chem. 342—Elementary Physical Chemistry | 3 |
| Chem. 292—Chemical Literature and Reference Work | 1 | Chem. 343—Elementary Physical Chemistry Laboratory | 1 |
| Chem. 336—Organic Chemistry | 3 | Electives[3] | 11 |
| Chem. 337—Organic Chemistry Laboratory | 2 | | |
| Econ. 108—Elements of Economics | 3 | | |
| Electives[3] | 3 | | |
| *Total* | 16 | *Total* | 16 |

## Fourth Year

| | | | |
|---|---|---|---|
| Chem. 327—Special and Instrumental Methods of Analysis | 3 | Electives[3] | 16 |
| Chem. 395—History of Science with Particular Reference to Chemistry | 2 | | |
| Electives[3] | 11 | | |
| *Total* | 16 | *Total* | 16 |

in Chem. 101 or 102, after which they will take Chem. 106 and 110. For students without entrance credit in chemistry, the required sequence is Chem. 101, 106, and 110.

[2] For students who do not take Math. 117 and 127, the required sequence is Math. 112 (or 111), 114 (or 115), 122, 132, and 142.

[3] Suggested electives are: Bact. 104 or 105; Bot. 100 or 101; Eng. 121 or 122; Geol. 130 or 150; Hist. 151 or 152; Zool. 101, 107, or 132; German or French. Of the total electives for graduation, at least twelve hours should be from advanced courses in chemistry and at least ten hours from courses offered by other departments.

## Curriculum in Chemical Engineering

*For the Degree of Bachelor of Science in Chemical Engineering*

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis | 5 | Chem. 108—General Chemistry and Qualitative Analysis | 5 |
| German, French, or Russian | 4 | German, French, or Russian | 4 |
| Math. 117—Combined Freshman Mathematics[1] | 5 | Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition | 3 | Math. 127—Combined Freshman Mathematics[1] | 4 |
| Physical Education | 1 | Rhet. 102—Rhetoric and Composition | 3 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 17 | *Total* | 18 |

### Second Year

| | | | |
|---|---|---|---|
| Chem. 124—Quantitative Analysis | 5 | Chem. 240—Elementary Physical Chemistry | 3 |
| G.E.D. 106—Elements of Drawing | 3 | Chem. 241—Elementary Physical Chemistry Laboratory | 1 |
| Math. 137—Calculus | 3 | General Studies Electives[2] | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Math. 147—Calculus | 3 |
| Physical Education | 1 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Military (men) | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| | | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 16 | *Total* | 17 |

### Third Year

| | | | |
|---|---|---|---|
| Ch.E. 261—Stoichiometry | 3 | Ch.E. 370—Chemical Engineering Thermodynamics | 3 |
| Ch.E. 267—Measurements and Instrumentation Laboratory | 2 | Ch.E. 371—Principles of Chemical Engineering | 4 |
| Chem. 234—Organic Chemistry | 5 | Ch.E. 372—Unit Operations Laboratory | 2 |
| Chem. 342—Elementary Physical Chemistry | 3 | Chem. 336—Organic Chemistry | 3 |
| General Studies Electives[2] | 3 | Chem. 337—Organic Chemistry Laboratory | 2 |
| | | T.A.M. 221—Resistance of Materials | 3 |
| | | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| *Total* | 16 | *Total* | 18 |

[1] For students who do not take Math. 117 and 127, the required sequence is Math. 112 (or 111), 114 (or 115), 122, 132, and 142.

[2] These electives should be chosen from the Division of Humanities or Social Sciences with the approval of the adviser. The courses are intended to broaden the engineer and provide an interest and liberal education in economics, history, literature, philosophy, political science, or public speaking.

### Fourth Year

| | | | |
|---|---|---|---|
| Ch.E. 266—Inspection Trip | ½ | Ch.E. 266—Inspection Trip | ½ |
| Ch.E. 373—Principles of Chemical Engineering | 4 | Ch.E. 377—Chemical Engineering Technology | 3 |
| Ch.E. 374—Unit Operations Laboratory | 2 | Ch.E. 379—Chemical Engineering Projects | 2 |
| Chem. 344—Principles of Chemical Thermodynamics | 2 | Ch.E. 381—Chemical Engineering Plant Design | 3 |
| E.E. 306—Direct and Alternating Current Circuits | 3 | E.E. 308—Direct and Alternating Current Apparatus | 3 |
| E.E. 307—Direct and Alternating Current Laboratory | 1 | E.E. 309—Direct and Alternating Current Laboratory | 1 |
| M.E. 204—Mechanical Engineering Laboratory | 2 | Electives[1] | 4 or 5 |
| Electives[1] | 2 or 3 | | |
| *Total* | 16½ or 17½ | *Total* | 16½ or 17½ |

## Optional Curriculum in Bioengineering

*For the Degree of Bachelor of Science in Chemical Engineering*

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis | 5 | Chem. 108—General Chemistry and Qualitative Analysis | 5 |
| German, French, or Russian[2] | 4 | German, French, or Russian[2] | 4 |
| Math. 117—Combined Freshman Mathematics[3] | 5 | Math. 127—Combined Freshman Mathematics[3] | 4 |
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 19 | *Total* | 20 |

[1] Five hours of electives must be chosen with the approval of the adviser from advanced courses in chemical engineering, chemistry, physics, mathematics, or other closely allied subjects.

[2] Two years of French and/or German are required for the B.S. degree. Two units of high school credit in either of these languages is equivalent to one year of college credit.

[3] For students who do not take Math. 117 and 127, the required sequence is Math 112 (or 111), 114 (or 115), 122, 132, and 142.

### Second Year

| | | | |
|---|---|---|---|
| Chem. 124—Quantitative Analysis | 5 | General Studies Electives[1] | 3 |
| G.E.D. 106—Elements of Drawing | 3 | Chem. 240—Elementary Physical Chemistry | 3 |
| Math. 137—Calculus | 3 | Chem. 241—Elementary Physical Chemistry Laboratory | 1 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Math. 147—Calculus | 3 |
| Physical Education | 1 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Military (men) | 1 | T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| | | Physical Education | 1 |
| | | Military (men) | 1 |
| *Total* | 18 | *Total* | 19 |

### Third Year

| | | | |
|---|---|---|---|
| Bact. 320—General Bacteriology | 5 | Ch.E. 370—Chemical Engineering Thermodynamics | 3 |
| Ch.E. 261—Stoichiometry | 3 | Ch.E. 371—Principles of Chemical Engineering | 4 |
| Chem. 234—Organic Chemistry | 5 | Ch.E. 372—Unit Operations Laboratory | 2 |
| General Studies Electives[1] | 3 | Chem. 336—Organic Chemistry | 3 |
| | | Chem. 350—Biochemistry | 5 |
| *Total* | 16 | *Total* | 17 |

### Fourth Year

| | | | |
|---|---|---|---|
| Ch.E. 266—Inspection Trip | ½ | Ch.E. 266—Inspection Trip | ½ |
| Ch.E. 373—Principles of Chemical Engineering | 4 | Ch.E. 386—Bioengineering | 5 |
| Ch.E. 385—Bioengineering | 5 | Ch.E. 381—Plant Design | 3 |
| Chem. 337—Organic Chemistry Laboratory | 2 | Chem. 344—Principles of Chemical Thermodynamics | 2 |
| Chem. 342—Physical Chemistry | 3 | E.E. 204—Application of Electrical Equipment | 2 |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 | E.E. 205—Electrical Equipment Laboratory | 1 |
| E.E. 203—Direct and Alternating Current Circuits and Machines Laboratory | 1 | T.A.M. 221—Resistance of Materials | 3 |
| | | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| *Total* | 17½ | *Total* | 17½ |

## Medicine and Dentistry

The three-year premedical curriculum outlined below includes the courses required for admission to the College of Medicine under the regulations governing students enrolled at Urbana for this purpose.

The work covered by the first two years of this curriculum also enables students to meet the requirements for admission to the College of Dentistry.

[1] These electives should be chosen from the Division of Humanities or Social Sciences with the approval of the adviser. The courses are intended to broaden the engineer and provide an interest and liberal education in economics, history, literature, philosophy, political science, or public speaking.

## Premedical Curriculum

This curriculum, which combines three years of work in the College of Liberal Arts and Sciences with one year of work in the College of Medicine, is available to students under the following conditions:

Any freshman whose scholarship rank is in the upper half of his high school graduating class, on matriculating in the College of Liberal Arts and Sciences, is eligible for admission to the premedical curriculum.

At the end of each semester the scholastic averages of all students enrolled in the premedical curriculum are computed. These students must maintain at least a 3.5 average during the first two semesters in the curriculum. By the end of the third semester, the average for the three semesters must be raised to 3.75, and this minimum average must be maintained. Students who fail to meet these minimum requirements will be transferred to the general curriculum until such time as they may have brought their averages up to the minimum.

Students applying for admission to the predentistry curriculum must have ranked in the upper half of their high school graduating class. They must maintain at all times in the curriculum a minimum average of 3.5 or they will be transferred to the general curriculum.

Students transferring to these curricula in this college with advanced standing must meet scholastic requirements at the level at which they transfer, the average to be computed in terms of the University's grading system.

Students who meet the language and liberal arts requirements and who complete three years of the premedical curriculum and the first year in the College of Medicine may, upon application, receive the degree of Bachelor of Science from the College of Liberal Arts and Sciences. No student may receive credit toward this degree for more than one year of work done in any other college or university.

Other factors being equal, students at Urbana who have completed the premedical curriculum with an average of 4.3 or better, will be given preferential consideration by the Committee on Admissions, provided that at least the second and third years have been done within the University.

### First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry[1] | 5 or 3 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Zool. 101—General Zoology | 5 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 0 to 3 |
| *Total* | 15 to 18 |

| SECOND SEMESTER | HOURS |
|---|---|
| Chem. 105—Inorganic Chemistry and Quantitative Analysis | 5 |
| Math. 114—Plane Trigonometry, or Math. 104—Elements of Algebra and Trigonometry[2] | 2 or 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Zool. 132—Comparative Vertebrate Anatomy | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 0 to 3 |
| *Total* | 15 to 18 |

[1] Students having credit for chemistry in high school will register for Chem. 102 (3 hours).

[2] Math. 114 is a prerequisite for physics in the second year and may be taken in either the first or second semester of the first year, or may be replaced by an elective if the student has credit for trigonometry in high school. Math. 104 (3 hours) will be substituted by students who have only two units of mathematics in high school.

### Second Year

| | |
|---|---|
| Chem. 122—Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 |
| Modern Language[1] | 4 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[2] | 2 to 4 |
| *Total* | 16 to 18 |

| | |
|---|---|
| Chem. 122—Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 |
| Modern Language[1] | 4 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[2] | 2 to 4 |
| *Total* | 16 to 18 |

### Third Year

| | |
|---|---|
| Chem. 247—Elementary Physical Chemistry, or Zool. 333—Vertebrate Embryology | 4 or 5 |
| Modern Language[1] | 4 |
| Electives[2] | 3 to 10 |
| *Total* | 16 to 18 |

| | |
|---|---|
| Chem. 247—Elementary Physical Chemistry, or Zool. 333—Vertebrate Embryology | 4 or 5 |
| Modern Language[1] | 4 |
| Electives[2] | 3 to 10 |
| *Total* | 16 to 18 |

## Prenursing Curriculum

To qualify for a degree of Bachelor of Science in Nursing, a student must complete a two-year program at the Urbana campus or at the Chicago Undergraduate Division at Navy Pier, followed by thirty to thirty-six months of professional training in one of the affiliated hospitals in Chicago. The four affiliated hospitals are Cook County, Michael Reese, Presbyterian, and St. Luke's Schools of Nursing.

Admission to the prenursing curriculum is restricted to students sixteen to twenty-eight years old. Students twenty-eight to thirty-three years old may enter subject to approval of the nursing advisory committee.

A minimum of sixty semester hours is required in the preprofessional program as indicated below:

| | HOURS |
|---|---|
| Biological Sciences (including a course in bacteriology) | 8 |
| Chemistry (one year of general and one semester of organic chemistry) | 10 |
| Humanities | 6 |
| Physics (a course specially designed for nurses or a year of college physics; special course not offered at Urbana) | 4 |
| Rhetoric and Composition | 6 |
| Social Sciences (including the equivalent of a course in sociology and a course in psychology) | 12 |
| Physical Education (four semesters) | |
| Electives (one year of foreign language recommended) | 14 |
| *Total* | 60 |

[1] Two semesters of a modern language (German, French, Spanish, etc.) at the college level are required for admission to the College of Medicine. The equivalent of two years of college work in a foreign language is required of students who are candidates for the bachelor's degree in the combined curriculum. (See Prescribed Subjects, item 5, page 177.)

[2] Electives in the second and third years should be arranged to satisfy the requirements for admission to the medical school which the student expects to enter. The College of Medicine of the University of Illinois requires fourteen semester hours from at least two of the following: economics, history, philosophy, political science, psychology, and sociology. It is recommended that students who will be candidates for a degree from the College of Liberal Arts and Sciences at the end of the first year in the College of Medicine plan to meet the general education sequence in social science by taking one of the following: Hist. 111, 112; Pol. Sci. 101, 102; Psych. 105, 106; or Sociol. 104, 105. The student should also satisfy the humanities sequence by one of the following: Phil. 101, 102, 105; Phil. 303, 306; Phil. 101 and any two 300 courses; Phil. 102 and any two 300 courses.

## Preveterinary Curriculum

Students applying for admission to the preveterinary curriculum must rank in the upper half of their high school graduating class. They must maintain at least a 3.5 average to remain in the curriculum, otherwise they will be transferred to the general curriculum.

Students transferring with advanced standing must have maintained at least a 3.5 average in terms of the University's grading system.

A minimum of sixty semester hours is required in the preprofessional curriculum.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Zool. 101—General Zoology | 5 | Bot. 100—General Botany | 4 |
| Chem. 101 or 102—General Chemistry | 3 or 5 | Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Math. 114—Plane Trigonometry, or Math. 104—Elements of Algebra and Trigonometry | 2 or 3 | Physical Education | 1 |
| Hygiene 101—Health Lectures | 2 | Military (men) | 1 |
| Physical Education | 1 | Electives | 4 to 7 |
| Military (men) | 1 | | |
| *Total* | 15 to 18 | *Total* | 16 to 19 |

### Second Year

| | | | |
|---|---|---|---|
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Language[1] | 4 | Language[1] | 4 |
| Chem. 122—Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 | Chem. 133—Elementary Organic Chemistry, or Chem. 122—Elementary Quantitative Analysis | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 2 to 4 | Electives | 2 to 4 |
| *Total* | 16 to 18 | *Total* | 16 to 18 |

[1] The student's attention is called to the advantages of continuing with the same language as was accepted for admission to the preveterinary curriculum.

## Curriculum in Occupational Therapy

This curriculum, which is open to both men and women, combines six semesters of work in the College of Liberal Arts and Sciences with five terms in the College of Medicine.

The work on the Urbana campus, which is mainly of a preprofessional character, is shown below. The student must accumulate a minimum of ninety semester hours and satisfy all of the preprofessional requirements before transferring to the College of Medicine. A minimum average of 3.5 must be maintained at all times in the curriculum.

### First Year

| | HOURS |
|---|---|
| Rhet. 101-102—Rhetoric and Composition, or D.G.S. 111-112—Verbal Communication | 6 to 8 |
| Zool. 101—General Zoology | 5 |
| Therapeutic Techniques[1] | 7 |
| Electives (foreign language, history, literature) | 8 to 10 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 2 |
| *Total* | 30 to 34 |

### Second Year

| | |
|---|---|
| O.T. 100—Occupational Therapy Orientation | 2 |
| Psych. 100—Introduction to Psychology | 4 |
| Sociol. 100—Principles of Sociology | 3 |
| Therapeutic Techniques[1] | 15 |
| Physical Education | 2 |
| Electives[2] | 4 to 6 |
| *Total* | 30 to 32 |

### Third Year

| | |
|---|---|
| Hygiene 216.—Medical Terminology Correlated with Community Health Problems | 2 |
| Physiol. 134—Human Anatomy and Physiology | 5 |
| Physiol. 235—Kinesiology | 3 |
| Psych. 138—Psychology Applied to Occupational Therapy | 2 |
| Psych. 216—Child Psychology | 3 |
| Therapeutic Techniques[1] | 12 |
| Electives[2] | 3 to 5 |
| *Total* | 30 to 32 |

[1] Designated courses selected with consent of the director of the curriculum from art, home economics, physical education, industrial education, and music.

[2] Suggested electives are: foreign language, history (American, English, European), art, literature, library science, and music appreciation.

## Curriculum Preparatory to the Teaching of Biology

*For the Degree of Bachelor of Science in the Teaching of the Biological Sciences and General Science*

This curriculum is for students preparing to teach biology and general science as major areas of specialization. A minimum of 123 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| | HOURS |
|---|---|
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition, and Speech 101—Principles of Effective Speaking; or D.G.S. 111-112—Verbal Communication | |
| Biological Sciences | 8 or 9 |
| Bot. 100—General Botany, and Zool. 101 or 104—General Zoology; or D.G.S. 131-132—Biological Science; or equivalent | |
| Foreign Language | 8 |
| A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance. | |
| Hygiene | 2 |
| Hygiene 101—Health Lectures | |
| Electives[1] | 1 or 5 |
| Physical Education | 2 |
| Military (men) | 2 |
| *Minimum Hours for First Year* | 34 |

[1] Not more than one-third of the total elective hours may be chosen from the sciences. The remainder should be selected, with the approval of the adviser, from the humanities and social sciences. The following science courses are especially recommended as electives: Anthrop. 107; Astron. 201 and 202; Bact. 106 and 308; Bot. 116 and 340; Geog. 111 and 123; Hort. 121 and 242; Math. 112 or 111; Zool. 107, 132, 341, and 351.

The following elective courses in the humanities and social sciences are especially recommended as electives: Art 111 and 112; Classics 101; Econ. 102 and 103; Engl. 101, 111, 112, 113, 131, 253, 355, and 356; Rhet. 144, 205, and 206; Hist. 111, 112, 131, 132, 181, 357, and 304; Journ. 215; Music 110 and 114; Phil. 101, 102, and 303; Psych. 130, 150, and 216; Sociol. 100; D.G.S. 151-152; and advanced courses in any foreign language.

## Second Year

Chemistry ..... 5 or 3
Chem. 101 or 102—General Chemistry, or equivalent
Education ..... 2
Ed. 101—The Nature of the Teaching Profession
History ..... 3
Hist. 152—History of the United States, 1865-1951
Physiology ..... 4
Physiol. 103—Introduction to Human Physiology, or equivalent
Systematic Botany ..... 3
Bot. 160—Introductory Systematic Botany, or Bot. 366—Field Botany (summer only in junior or senior year)
Plant Morphology ..... 3
Bot. 120—Survey of the Plant Kingdom, or Bot. 304—General Plant Morphology (in junior or senior year)
Political Science ..... 3
Pol. Sci. 150—American Government, or equivalent
Psychology ..... 4
Psych. 100—Introduction to Psychology, or Psych. 103—Human Behavior
Physical Education ..... 2
Military (men) ..... 2
Electives[1] ..... 2 to 4

*Minimum Hours for Second Year* ..... 31

## Third Year

Education ..... 4
Ed. 201—Foundations of American Education, and Ed. 240—Principles of Secondary Education
Bacteriology ..... 5
Bact. 104-105—Introductory Bacteriology
Physical Science ..... 8 or 9
D.G.S. 141-142—Physical Science, or one course each in astronomy, geology, and physics
Geography ..... 5
Geog. 101—Elements of Geography, or equivalent
Entomology ..... 4 or 5
Entom. 103—Life of Insects, or Entom. 101-102—Destructive and Useful Insects
Ornithology ..... 3
Zool. 335—Ornithology
Electives[1] ..... 3 or 4

*Minimum Hours for Third Year* ..... 32 or 33

## Fourth Year

FIRST SEMESTER

Genetics ..... 4 or 5
Bot. 322—Genetics, or Zool. 351-352—Genetics, or equivalent
Field Zoology ..... 3
Zool. 304—Field Zoology
Ecology ..... 3
Bot. 381—Plant Ecology, or Zool. 345—Animal Ecology and Geography, or Zool. 342—Wildlife Management and Conservation
Humanities ..... 3 or 4
Courses in English literature, philosophy, or history (other than Hist. 152)
Electives[1] ..... 3 or 4

*Minimum Hours for First Semester* ..... 16

[1] *(See footnote on facing page.)*

## Fourth Year

SECOND SEMESTER

| | |
|---|---|
| Education | 11 |
| Ed. 211—Educational Psychology, Ed. 241—Technic of Teaching in the Secondary School, Ed. 242—Educational Practice in Secondary Education | |
| Biology | 2 |
| Bot. 306 or Zool. 306—Biology for Teachers | |
| *Minimum Hours for Second Semester* | 13 |

## Fifth Year

*For the Degree of Master of Science in the Teaching of the Biological Sciences and General Science*

Candidates for the degree of Master of Science in the Teaching of the Biological Sciences and General Science must earn four units in biological sciences, two units in education, and two units in electives. The courses in the biological sciences and the electives must be selected with the approval of the adviser. The electives may be in the biological sciences, in education, or, in exceptional cases, in other fields. A course in biological chemistry and one in experimental psychology are strongly advised.

| | UNITS |
|---|---|
| Biological Sciences | 4 |
| Electives | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| *Total* | 8 |

## BIOLOGY AS A FIRST UNDERGRADUATE MINOR

| | HOURS |
|---|---|
| Bact. 104-105—Introductory Bacteriology | 5 |
| Bot. 100—General Botany | 4 |
| Entom. 101-102—Destructive and Useful Insects | 5 |
| Zool. 101—General Zoology | 5 |
| *Total* | 19 |

## BIOLOGY AS A SECOND UNDERGRADUATE MINOR

| | HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Entom. 101—Destructive and Useful Insects | 3 |
| Physiol. 103—Introduction to Human Physiology | 4 |
| Zool. 101—General Zoology | 5 |
| *Total* | 16 |

## GENERAL SCIENCE AS AN UNDERGRADUATE MINOR

| | HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| D.G.S. 141-142—Physical Science | 8 |
| Geog. 101—Elements of Geography | 5 |
| Zool. 101—General Zoology | 5 |
| *Total* | 25 or 27 |

## Curriculum Preparatory to the Teaching of Chemistry

*For the Degree of Bachelor of Science in the Teaching of Chemistry*

This curriculum is for students preparing to teach physical science with a major in chemistry and with minors in physics and mathematics. The courses outlined below total 127 to 132 hours. A minimum of 125 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

If the student has not had adequate high school training in mathematics, he may be required to take Math. 106 or other elementary mathematics.

If the student has had no foreign language in high school or if he does not continue in the University the same language which he began in high school, it will be necessary for him to take two years of foreign language rather than the one year specified below.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 106—Inorganic Chemistry[1] | 5 |
| Math. 117—Combined Freshman Mathematics | 5 | Math. 127—Combined Freshman Mathematics | 4 |
| Hygiene 101—Health Lectures, or Elective | 2 | Ed. 101—The Nature of the Teaching Profession | 2 |
| Military (men) | 1 | Hygiene 101—Health Lectures, or Elective | 2 |
| Physical Education | 1 | Military (men) | 1 |
| Electives[1] | 2 | Physical Education | 1 |
| *Total* | 16 to 19 | *Total* | 17 or 18 |

### Second Year

| | | | |
|---|---|---|---|
| Chem. 110—Qualitative Analysis | 5 | Chem. 124—Quantitative Analysis | 5 |
| Foreign Language[2] | 4 | Foreign Language[2] | 4 |
| Physics 101 or 103—General Physics | 5 | Physics 102 or 104—General Physics | 5 |
| Military (men) | 1 | Military (men) | 1 |
| Physical Education | 1 | Physical Education | 1 |
| *Total* | 15 or 16 | *Total* | 15 or 16 |

[1] A student who takes Chem. 102 rather than Chem. 101, and who is to take four semesters of foreign language in the University, should commence his language in the first semester of his university career. This will necessitate postponing each chemistry course (except Chem. 102) by one semester.

[2] A student who completed his foreign language requirement in high school should take Math. 137 and 147 in the sophomore year, rather than in the junior year.

## Third Year

| | |
|---|---|
| Chem. 133—Elementary Organic Chemistry, or Chem. 234—Organic Chemistry | 5 |
| Math. 137—Calculus[1] | 3 |
| Physics | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Speech 101—Principles of Effective Speaking[2] | 3 |
| *Total* | 18 |

| | |
|---|---|
| Chem. 240-241—Elementary Physical Chemistry, or Chem. 350—Biochemistry | 4 or 5 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Math. 147—Calculus[1] | 3 |
| Physics | 3 |
| Elective | 2 |
| *Total* | 16 or 17 |

## Fourth Year

(Semesters are interchangeable)

| | |
|---|---|
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Math. 301 or 302—Fundamental Concepts of Mathematics | 3 |
| Physics | 3 |
| Pol. Sci. 150—American Government | 3 |
| Chemistry Elective | 2 |
| Other Electives | 2 |
| *Total* | 16 |

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| *Total* | 12 |

## Fifth Year

*For the Degree of Master of Science in the Teaching of Chemistry*

| | UNITS |
|---|---|
| Chemistry | 4 |
| Electives | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following courses: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN CHEMISTRY

| | HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Chem. 122—Elementary Quantitative Analysis | 5 |
| Chem. 133—Elementary Organic Chemistry | 5 |
| *Total* | 18 to 20 |

[1] A student who completed his foreign language requirement in high school should take Math. 137 and 147 in the sophomore year, rather than in the junior year.

[2] The speech requirement is satisfied if the student has taken D.G.S. 111 and D.G.S. 112 in place of Rhet. 101 and 102.

## Curriculum Preparatory to the Teaching of English

*For the Degree of Bachelor of Arts in the Teaching of English*

The courses outlined below total 130 to 136 hours. A minimum of 128 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen hours. In addition, beginning teachers may need to complete a second teaching minor of sixteen semester hours. Desirable teaching combinations with English include art, music; double minors in French and Latin; German and Latin; history and music; history and physical education; home economics and physical education; Latin and music; Latin and physical education; Latin and Spanish; music and physical education; speech and Latin; speech and music; speech and physical education; journalism and history; journalism and Latin; speech and history.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Foreign Language[1] | 4 | Foreign Language[1] | 4 |
| Mathematics or Science[2] | 3 | Mathematics or Science[2] | 3 |
| Hygiene 101—Health Lectures | 2 | Military (men) | 1 |
| Military (men) | 1 | Physical Education | 1 |
| Physical Education | 1 | Electives | 5 |
| Electives | 3 | | |
| *Total* | 16 to 18 | *Total* | 16 to 18 |

### Second Year

| | | | |
|---|---|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 | Engl. 114—American Literature | 3 |
| Engl. 113—American Literature | 3 | Pol. Sci. 150—American Government | 3 |
| Engl. 131—Introduction to Shakespeare | 3 | Psych. 100—Introduction to Psychology | 4 |
| Foreign Language[1] | 4 | Foreign Language[1] | 4 |
| Speech Electives | 3 | Military (men) | 1 |
| Military (men) | 1 | Physical Education | 1 |
| Physical Education | 1 | Electives | 2 |
| *Total* | 16 or 17 | *Total* | 17 or 18 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Six semester hours of natural science are required. The courses in biological science and physical science in the Division of General Studies are especially recommended.

### Third Year

| | | | |
|---|---|---|---|
| Rhet. 246—Modern English Grammar | 3 | Ed. 201—Foundations of American Education | 2 |
| English Electives[1] | 6 | Ed. 240—Principles of Secondary Education | 2 |
| Speech 141—Oral Interpretation of Literature | 3 | Lib. Sci. 304—Library Materials for Adolescents | 3 |
| Hist. 152—History of the United States, 1865-1951 | 3 | Engl. 355—Survey of English Literature | 3 |
| Electives | 3 | Rhet. 133—Expository Writing | 3 |
| | | Journ. 308—High School Journalism | 3 |
| *Total* | 18 | *Total* | 16 |

### Fourth Year

| | | | |
|---|---|---|---|
| Engl. 356—Survey of English Literature | 3 | Ed. 211—Educational Psychology | 3 |
| Electives[1] (four of which must be in English) | 12 | Ed. 219—Remedial Reading in the High School | 3 |
| | | Ed. 241—Technic of Teaching in the Secondary School | 5 |
| | | Ed. 242—Educational Practice in Secondary Education | 5 |
| *Total* | 15 | *Total* | 16 |

### Fifth Year

*For the Degree of Master of Arts in the Teaching of English*

| | UNITS | | UNITS |
|---|---|---|---|
| English[2] | 2 | English[2] | 2 |
| Electives | 1 | Electives | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| | | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| *Total* | 4 | *Total* | 4 |

## UNDERGRADUATE MINOR IN ENGLISH

| | HOURS |
|---|---|
| Rhet. 101-102—Rhetoric and Composition, or D.G.S. 111-112—Verbal Communication | 6 or 8 |
| Engl. 113-114—American Literature | 6 |
| Rhet. 133—Expository Writing | 3 |
| Engl. 355-356—Survey of English Literature | 6 |
| *Total* | 21 to 23 |

[1] Six of the ten hours of English electives must be in courses restricted to advanced undergraduates.

[2] Rhet. 480 is especially recommended. Candidates for junior college teaching should take Rhet. 480.

## Curriculum Preparatory to the Teaching of French

*For the Degree of Bachelor of Arts in the Teaching of French*

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation. Copies of a sample curriculum in mimeographed form are available at 230 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 4 |
| Physical Education | 4 |
| Pol Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in French | 36 |
| French 101-102—Elementary Course | 8 |
| French 103-104—Modern French | 8 |
| French 201-202—Introduction to French Literature | 6 |
| French 211-212—Oral French | 4 |
| French 213-214—Composition | 4 |
| French 215-216—Advanced Conversation | 4 |
| French 282—Methods of Teaching French | 2 |
| Teachers' Minor | at least 16 |
| Desirable teaching combinations with French include English, foreign languages, history, music, and physical education. A double major in French and English and a double major in French and Latin with English or history as a minor subject are also recommended. Additional hours toward certification may be gained from basic courses credited from a secondary school. | |
| Electives | 15 to 14 |
| Advanced courses in French civilization and literature are recommended, particularly for students who have completed basic French courses in secondary school. Other courses in language and literature, geography, history, philosophy, art, and music are also recommended. | |
| *Total* | at least 120 |

### Fifth Year

*For the Degree of Master of Arts in the Teaching of French*

The student's program will be worked out in conference with the adviser in the major area of specialization. The program will total a minimum of eight units or 32 semester hours for two semesters. French 409 and 410 are required.

| | UNITS |
|---|---|
| French 409—The Phonetics of French, and French 410—Advanced Syntax | 2 |
| French | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Electives | 2 |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN FRENCH

The minor in French requires four hours of oral work supplementary to courses 101, 102, 103, and 104. Total hours required may be reduced by entrance credits in French. Additional courses recommended are French 201, 202, 213, 214, 215, and 216.

| | HOURS |
|---|---|
| French 101-102—Elementary Course | 8 |
| French 103-104—Modern French | 8 |
| French 211-212—Oral French | 4 |
| *Total* | 20 |

## Curriculum Preparatory to the Teaching of Geography

*For the Degree of Bachelor of Science in the Teaching of Geography*

The courses outlined below total 127 to 131 hours. A minimum of 123 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. In addition, the beginning teacher of geography may need to be prepared to teach a second minor requiring a minimum of sixteen hours. It is strongly recommended that the minor or minors supplement the nature of the major. A major that is directed toward physical geography should select a minor from biology or geology, whereas a major directed toward cultural geography should select a minor from the social sciences. However, the combining of a physical geography major with a social studies minor or a cultural geography major with a physical science minor is advantageous for candidates expecting to teach in small high schools. For those whose major is directed toward regional geography, a second minor in foreign language, especially the language of the major region of specialization, is recommended. A minor in economic and commercial subjects is another possibility.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Geog. 101—Elements of Geography[1] | 5 | Geog. 104—World Regional Geography | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Foreign Language[2] | 4 | Foreign Language[2] | 4 |
| Military (men) | 1 | Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 | Military (men) | 1 |
| Electives | 3 | Physical Education | 1 |
| | | Electives | 3 |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

## Second Year

| | | | |
|---|---|---|---|
| Geography | 3 | Geography | 3 |
| Ed. 101—The Nature of the Teaching Profession | 2 | Military (men) | 1 |
| Psych. 100—Introduction to Psychology | 4 | Physical Education | 1 |
| Speech 101—Principles of Effective Speaking | 3 | Electives | 12 |
| Military (men) | 1 | | |
| Physical Education | 1 | | |
| Electives | 3 | | |
| *Total* | 16 or 17 | *Total* | 16 or 17 |

## Third Year

| | | | |
|---|---|---|---|
| Geography | 4 | Geography | 6 |
| Ed. 201—Foundations of American Education | 2 | Pol. Sci. 150—American Government | 3 |
| Ed. 240—Principles of Secondary Education | 2 | Electives | 8 |
| Hist. 152—History of the United States, 1865-1951 | 3 | | |
| Electives | 5 | | |
| *Total* | 16 | *Total* | 17 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Geography | 6 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 | Geog. 371—Introduction to Research | 2 |
| Ed. 242—Educational Practice in Secondary Education | 5 | Electives | 9 |
| *Total* | 13 | *Total* | 17 |

[1] Of the thirty-two hours of geography required for certification, ten hours must consist of Geog. 101, 104, and 371. The remaining twenty-two hours may be selected by permission of the adviser from the course offerings of the department of geography, including in the selection at least one course from each of the following: physical geography; economic, social, or political geography; regional geography; and geographic techniques.

[2] A reading knowledge of a foreign language (German, French, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

### Fifth Year

*For the Degree of Master of Science in the Teaching of Geography*

| | UNITS | | UNITS |
|---|---|---|---|
| Geog. 495—Advanced Studies in Geography | 1 | Geog. 494—Research | 1 |
| Geography Elective | 1 | Geography Elective | 1 |
| Electives | 1 | Electives | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| | | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| *Total* | 4 | *Total* | 4 |

## UNDERGRADUATE MINOR IN GEOGRAPHY

| | HOURS |
|---|---|
| Geog. 101—Elements of Geography | 5 |
| Geog. 105—Introductory Economic Geography | 3 |
| Geography (regional courses)[1] | 8 |
| *Total* | 16 |

## Curriculum Preparatory to the Teaching of German

*For the Degree of Bachelor of Arts in the Teaching of German*

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation. Copies of a sample curriculum in mimeographed form are available at 230 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 4 |
| Physical Education | 4 |

[1] It is recommended that regional courses be taken in related sequences, such as Eastern and Western North America, Caribbean and South America. These courses should be selected from Geog. 111, 221, 222, 231, 232, 313, 342, and 351.

| | |
|---|---|
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in German | 42 to 44 |
| German 101-102—Elementary Course[1] | 8 |
| German 103—Intermediate Course | 4 |
| German 104—Intermediate Course, or German 144—Scientific German | 4 |
| German 210—Masterpieces of German Literature | 3 |
| German 211-212—Conversation and Writing[2] | 4 |
| German 246—Advanced Conversation and Writing | 2 |
| German 251—Modern German Fiction, German 252—Modern German Drama, or German 260—Lyrics and Ballads | 3 |
| German 281—Teachers' Course | 2 |
| German 301-302—Survey of German Literature, German 311-312—Goethe and Goethe's *Faust*, or German 331-332—German Classics | 6 |
| German 360—Introduction to German Phonetics | 2 |
| Art 111—Introduction to Ancient and Medieval Art, Engl. 363—Introduction to Comparative Literature, or Music 110—Appreciation of Music | 2 or 3 |
| Art 112—Introduction to Renaissance and Modern Art, or Music 114—Appreciation of Music | 2 or 3 |
| Teachers' Minor | at least 16 |
| Desirable teaching combinations with German include English, French, history, Latin, music, physical education, or Spanish. A double major in German and English with Latin or history as a minor is also recommended. | |
| Electives | 9 to 6 |
| Recommended electives are Art 111, 112, Engl. 363, 364, Music 110, 114, 117, Phil. 101, advanced German courses not included in the minimum program, and other language and literature courses. | |
| *Total* | at least 120 |

## Fifth Year

*For the Degree of Master of Arts in the Teaching of German*

The work will be planned to meet the needs of the individual student on the basis of his preparation and the demands of his teaching position. Since all the classes he attends will be small, special attention will always be given to his professional needs.

Courses are to be chosen from the following list:

| | UNITS |
|---|---|
| Courses to be chosen from the following | 2 to 2½ |
| German 301—German Literature to the Eighteenth Century | 1 |
| German 302—German Literature Since the Eighteenth Century | 1 |
| German 311—Goethe | 1 |
| German 312—Goethe's *Faust* | 1 |
| German 320—History of German Civilization | 1 |
| German 331—German Classics I (Lessing, Herder, Wieland) | 1 |
| German 332—German Classics II (Schiller, Kleist, Hölderlin, Jean Paul) | 1 |
| German 415—Middle High German | 1 |

[1] Students are advised to register in the intensive (spoken) sections of this course.

[2] Students who have taken the intensive (spoken) sections of German 101-102 may be excused from German 211.

| | |
|---|---|
| German Courses Open Only to Graduates (numbered 400 and up) | 1½ to 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Electives | 2 |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN GERMAN

| | HOURS |
|---|---|
| German 101-102—Elementary Course | 8 |
| German 103—Intermediate Course | 4 |
| German 104—Intermediate Course, or German 144—Scientific German | 4 |
| Five hours selected from the following: | |
| German 210—Masterpieces of German Literature | 3 |
| German 211—Conversation and Writing | 2 |
| German 212—Conversation and Writing | 2 |
| German 246—Advanced Conversation and Writing | 2 |
| *Total* | 21 |

## Curriculum Preparatory to the Teaching of Latin

*For the Degree of Bachelor of Arts in the Teaching of Latin*

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Copies of a sample curriculum in mimeographed form are available at 126 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

| | HOURS | |
|---|---|---|
| Education | | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 | |
| Ed. 201—Foundations of American Education | 2 | |
| Ed. 211—Educational Psychology | 3 | |
| Ed. 240—Principles of Secondary Education | 2 | |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | |
| Ed. 242—Educational Practice in Secondary Education | 5 | |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | | |
| General Education | | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | | |
| Hist. 152—History of the United States, 1865-1951 | | 3 |
| Hygiene 101—Health Lectures | | 2 |
| Military (men) | | 4 |
| Physical Education | | 4 |
| Pol. Sci. 150—American Government | | 3 |
| Psych. 100—Introduction to Psychology | | 4 |

| | |
|---|---|
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition, Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in Latin[1] | 34 to 42 |
| Latin 101-102—Elementary Latin | 8 |
| Latin 103-104—Intermediate Latin | 8 |
| Latin 113-114—Latin Composition | 4 |
| Latin 201-202—Survey of Latin Literature | 6 |
| Latin 301—Livy and Tacitus, Latin 302—Horace, Latin 303—Cicero, Latin 304—Vergil (any two) | 6 |
| Latin 311-312—Advanced Latin Composition | 4 |
| Latin 162—Roman Private Life | 1 |
| Classics 101—Mythology of Greece and Rome | 2 |
| Hist. 383—The Roman Republic | 3 |
| Teachers' Minor | at least 16 |
| Desirable teaching combinations with Latin include a minor in English or Spanish, a double minor in English and Spanish, a double major in Latin and English or Latin and a foreign language (Spanish, French, or German), or any combination of language with an additional minor in social studies, physical education, or library science. Additional hours toward certification may be gained from basic courses credited from secondary school. | |
| Electives | 17 to 8 |
| Recommended electives are Greek 101, 102, 201, 202; Hist. 181, 182, 381; Humanities 301; Phil. 303; and advanced courses in Latin. | |
| *Total* | at least 120 |

## Fifth Year

*For the Degree of Master of Arts in the Teaching of Latin*

The work will be planned to meet the needs of the individual student on the basis of his preparation and of the demands of his teaching position. Since all the classes he attends will be small, special attention will always be given his professional needs.

Candidates for this degree must earn four units in Latin and two units in education. At least two of the units in Latin must be in courses numbered 400 or above. Courses are to be chosen from the following list:

| | UNITS |
|---|---|
| Latin Courses Open Only to Graduates | 2 |
| Courses to be chosen from the following | 2 |
| Latin 301—Livy and Tacitus | ½ |
| Latin 302—Horace | ½ |
| Latin 303—Cicero | ½ |
| Latin 304—Vergil | ½ |
| Latin 311—Advanced Latin Composition | ½ |
| Latin 312—Advanced Latin Composition | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Electives | 2 |
| *Total* | 8 |

[1] Students entering with two units of high school Latin will begin with Latin 103; those entering with three units will begin with Latin 104; those entering with four units will begin with Latin 201 and will add one more course from 301-304.

## UNDERGRADUATE MINOR IN LATIN

| | HOURS |
|---|---|
| Latin 101 and 102—Elementary Latin, or two years of high school Latin | 8 |
| Latin 103—Intermediate Latin, or three years of high school Latin | 4 |
| Latin 104—Intermediate Latin, or four years of high school Latin | 4 |
| Latin 113-114—Latin Composition | 4 |
| Latin 201-202—Survey of Latin Literature | 6 |

Latin 201 and 202 may be omitted when the study of Latin is begun in college. One course (three hours) from Latin 301, 302, 303, or 304, in addition to Latin 201 and 202, is required for those entering college with four years of high school Latin.

The total number of hours in Latin required for a minor will thus vary as follows:

| | HOURS |
|---|---|
| a. When Latin is begun in college | 20 |
| b. When two years of high school Latin have been accepted for entrance | 18 |
| c. When three years of high school Latin have been accepted for entrance | 14 |
| d. When four years of high school Latin have been accepted for entrance | 13 |

## Curriculum Preparatory to the Teaching of Mathematics

*For the Degree of Bachelor of Science in the Teaching of Mathematics*

This curriculum offers training for teachers of high school and junior college courses in beginning and advanced algebra, general mathematics, practical mathematics, plane and solid geometry, trigonometry, and college algebra.

The courses outlined below total 123 to 134 hours. A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Acceptable minors include commercial subjects, biology, general science, chemistry, physics, English, foreign language, social studies, and physical education. Foreign languages acceptable for a teaching minor are French, German, Latin, and Spanish.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Oral and Written Expression[1] | 3 or 4 | Oral and Written Expression[1] | 3 or 4 |
| Foreign Language[2] | 4 | Foreign Language[2] | 4 |
| Freshman Mathematics[2] | 5 | Freshman Mathematics[2] | 4 |
| Hygiene 101—Health Lectures | 2 | Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 15 to 17 | *Total* | 15 to 17 |

[1] The certification requirement of oral and written expression may be satisfied by either of the following sequences of courses: D.G.S. 111 and 112, or Rhet. 101 and 102 and Speech 101.

[2] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced

## Second Year

| | |
|---|---|
| Biological Science[4] | 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Humanities[5] or Social Science[6] | 4 |
| Mathematics (Calculus)[7] | 3 or 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 14 to 17 |

| | |
|---|---|
| Biological Science[4] | 4 |
| Humanities[5] or Social Science[6] | 4 |
| Mathematics (Calculus)[7] | 3 |
| Psych. 100—Introduction to Psychology,[4] or Elective | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 16 or 17 |

## Third Year

| | |
|---|---|
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Math. 301—Fundamental Concepts of Mathematics | 3 |
| Math. 311—Advanced Algebra | 3 |
| Physical Science[8] | 4 or 5 |
| Elective | 3 |
| *Total* | 16 or 17 |

| | |
|---|---|
| Math. 302—Fundamental Concepts of Mathematics | 3 |
| Math. 312—Advanced Algebra | 3 |
| Physical Science[8] | 4 or 5 |
| Pol. Sci. 150—American Government | 3 |
| Elective | 3 |
| *Total* | 16 or 17 |

## Fourth Year

| | |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Math. 222—Advanced Aspects of Euclidean Geometry | 3 |
| Electives | 9 |
| *Total* | 16 |

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Math. 205—Teachers' Course | 3 |
| *Total* | 16 |

course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[3] A student who enters the University with one and a half units of high school algebra and one unit of plane geometry may satisfy the freshman mathematics requirement by completion of either of the following sequences of courses: Math. 117 and 127, or Math. 112, 114, and 122. A student who enters the University with one unit of high school algebra and one unit of plane geometry will satisfy the requirement by completion of the following sequence: Math. 111, 114, and 122. A student who enters the University without one-half unit in solid geometry must remove this deficiency by either taking Math. 106 or passing a proficiency examination in that course.

[4] The biological science requirement may be satisfied by completion of one of the following sequences: Physiol. 103 and Psych. 103; Bot. 100 and Zool. 104; or D.G.S. 131 and 132. Students whose minor teaching subject is not general science or biology and who elect as their biological science Physiol. 103 and Psych. 103 will have satisfied the prerequisite for Ed. 211 and are excused from Psych. 100. Students whose minor teaching subject is either general science or biology are required to take Bot. 100 and Zool. 104, or D.G.S. 131 and 132 and Psych. 100.

[5] The humanities requirement may be satisfied by a minor in the humanities (including foreign language) or by any one of the following sequences: D.G.S. 121 and 122; D.G.S. 161 and 162; Engl. 121 and 122; Humanities 211 and 212; Hist. 111 and 112; Hist. 131 and 132 and a course in English literature; Engl. 253, 363, and 364; Classics 101, 103, and 106; Classics 103, 106, and 110; Phil. 101, 102, and 105; Phil. 303 and 306.

[6] The social science requirement may be satisfied by a minor in the social sciences or by either of the following sequences: D.G.S. 151 and 152; or Sociol. 104 and 105.

[7] Those students who take Math. 117 and 127 during their freshman year should take Math. 137 and 147 during their sophomore year. Those students who take Math. 112, 114, and 122, or Math. 111, 114, and 122 must take Math. 132 and 142.

[8] The physical science requirement may be satisfied by a minor in chemistry or by any one of the following sequences: D.G.S. 141 and 142; Physics 101 and 102; Physics 103 and 104.

### Fifth Year

*For the Degree of Master of Science in the Teaching of Mathematics*

| | UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Math. 317—Introduction to Higher Algebra, or Math. 327—Introduction to Higher Geometry | 1 |
| Mathematics Elective | 1 |
| Elective | 1 |
| *Total* | 4 |

| | UNITS |
|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Math. 318—Introduction to Higher Algebra, or Math. 328—Introduction to Higher Geometry | 1 |
| Mathematics Elective | 1 |
| Elective | 1 |
| *Total* | 4 |

## UNDERGRADUATE MINOR IN MATHEMATICS

| | HOURS |
|---|---|
| Math. 117 and 127—Combined Freshman Mathematics | 9 |
| Math. 137 and 147—Calculus | 6 |
| Math. 301—Fundamental Concepts of Mathematics | 3 |
| Math. 302—Fundamental Concepts of Mathematics (recommended but not required) | 3 |
| *Total* | 18 to 21 |

## Curriculum Preparatory to the Teaching of Mathematics and the Physical Sciences

*For the Degree of Bachelor of Science in the Teaching of Mathematics and the Physical Sciences*

This curriculum satisfies the requirements for mathematics as a major teaching subject, with chemistry and physics (also general science) as minor teaching subjects. The courses outlined below total 129 to 135 hours. A minimum of 123 hours of credit, not counting the first two years in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS |
|---|---|
| D.G.S. 111—Verbal Communication | 4 |
| Math. 117—Combined Freshman Mathematics | 5 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 15 to 18 |

| SECOND SEMESTER | HOURS |
|---|---|
| D.G.S. 112—Verbal Communication | 4 |
| Math. 127—Combined Freshman Mathematics | 4 |
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| English or American Literature | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 16 or 17 |

## Second Year

| | | | |
|---|---|---|---|
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| Chem. 122—Elementary Quantitative Analysis | 5 | Chem. 133—Elementary Organic Chemistry | 5 |
| Biology | 4 | Biology | 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 | Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 17 or 18 | *Total* | 17 or 18 |

## Third Year

| | | | |
|---|---|---|---|
| Math. 301—Fundamental Concepts of Mathematics | 3 | Math. 302—Fundamental Concepts of Mathematics | 3 |
| Math. 311—Advanced Algebra | 3 | Math. 312—Advanced Algebra | 3 |
| Physics 103—General Physics (Mechanics, Heat and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Hist. 152—History of the United States, 1865-1951 | 3 | Ed. 201—Foundations of American Education | 2 |
| Phil. 102—Logic | 3 | Ed. 240—Principles of Secondary Education | 2 |
| *Total* | 17 | *Total* | 15 |

## Fourth Year

| | | | |
|---|---|---|---|
| Math. 205—Teachers' Course | 3 | Ed. 211—Educational Psychology | 3 |
| Math. 222—Advanced Aspects of Euclidean Geometry | 3 | Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Phil. 303—History of Greek and Roman Philosophy, or Phil. 306—History of Modern Philosophy | 4 | Ed. 242—Educational Practice in Secondary Education | 5 |
| Physics 341—Electricity and Magnetism | 3 | Physics 342—Electricity and Magnetism | 3 |
| Pol. Sci. 150—American Government | 3 | | |
| *Total* | 16 | *Total* | 16 |

## Fifth Year

*For the Degree of Master of Science in the Teaching of Mathematics and the Physical Sciences*

| | UNITS | | UNITS |
|---|---|---|---|
| Math. 347—Introduction to Higher Analysis: Real Variables, or Math. 343—Advanced Calculus | 1 | Math. 348—Introduction to Higher Analysis: Complex Variables, or Math. 345—Differential Equations and Orthogonal Functions | 1 |
| Chem. 240—Physical Chemistry | 1 | Physics 322—Theoretical Mechanics | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| Elective | 1 | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| | | Elective | 1 |
| *Total* | 4 | *Total* | 4 |

## Curriculum Preparatory to the Teaching of Physics

*For the Degree of Bachelor of Science in the Teaching of Physics*

This program is for students preparing to teach physical science. Students entering this curriculum should have two and one-half units of high school mathematics. A minimum of 129 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 212) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Hygiene 101—Health Lectures | 2 |
| Math. 112—College Algebra | 3 |
| Math. 114—Plane Trigonometry | 2 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 14 to 18 |

| SECOND SEMESTER | HOURS |
|---|---|
| Rhet. 102—Rhetoric and Composition, and Speech 101—Principles of Effective Speaking, or D.G.S. 112—Verbal Communication | 6 or 4 |
| Math. 122—Analytic Geometry | 4 |
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 16 to 19 |

### Second Year

| | |
|---|---|
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Math. 132—Calculus | 5 |
| Foreign Language[1] | 4 |
| Pol. Sci. 150—American Government | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 18 or 19 |

| | |
|---|---|
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Math. 142—Calculus | 3 |
| Foreign Language[1] | 4 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| *Total* | 17 or 18 |

### Third Year

| | |
|---|---|
| Physics 281—Intermediate Atomic Physics | 3 |
| Chem. 122—Elementary Quantitative Analysis | 5 |
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Electives[2] | 6 or 7 |
| *Total* | 17 or 18 |

| | |
|---|---|
| Physics 360 or 260—Heat | 3 or 2 |
| Chem. 132—Elementary Organic Chemistry | 3 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Electives[2] | 6 or 7 |
| *Total* | 16 or 17 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in

### Fourth Year

| | | | |
|---|---|---|---|
| Physics (241 or 221 if offered) | 3 | Ed. 211—Educational Psychology | 3 |
| Physics 270—Intermediate Light | 3 | Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Electives | 10 or 11 | Ed. 242—Educational Practice in Secondary Education | 5 |
| *Total* | 16 or 17 | *Total* | 13 |

### Fifth Year

*For the Degree of Master of Science in the Teaching of Physics*

| | UNITS |
|---|---|
| Physics | 4 |
| Electives | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| *Total* | 8 |

*For the Degree of Master of Science in the Teaching of the Physical Sciences*

| | UNITS |
|---|---|
| Physical Science | 4 |
| Electives | 2 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN PHYSICS

| | HOURS |
|---|---|
| Physics 101 and 102, or 103 and 104—General Physics | 10 |
| Advanced Physics | 10 |
| *Total* | 20 |

a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Students are strongly advised to concentrate their electives to obtain additional and appropriate teaching subjects such as biology. Electives chosen from the humanities and social sciences are also recommended.

## Curriculum Preparatory to the Teaching of Social Studies[1]

*For the Degree of Bachelor of Arts in the Teaching of Social Studies*

The courses outlined below total 129 to 139 hours. A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 121—History of Civilization[2] | 4 | D.G.S. 122—History of Civilization[2] | 4 |
| Foreign Language[3] | 4 | Foreign Language[3] | 4 |
| Hygiene 101—Health Lectures | 2 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Science or Mathematics | 5 |
| Science or Mathematics | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | | |
| *Total* | 17 to 19 | *Total* | 17 to 19 |

### Second Year

| | | | |
|---|---|---|---|
| Ed. 101—The Nature of the Teaching Profession[4] | 2 | Foreign Language | 4 |
| Foreign Language | 4 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Pol. Sci. 150—American Government | 3 | Social Studies[5] | 5 |
| Social Studies[5] | 6 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Electives | 4 |
| *Total* | 16 or 17 | *Total* | 17 or 18 |

[1] This is a specimen curriculum and may be varied with the advice of the adviser. However, all of the courses listed in the curriculum must be taken at some point in the student's schedule.

[2] Students may substitute Hist. 111 and 112, 131 and 132, or 181 and 182.

[3] A student who has completed two years of foreign language in high school may register in second-year University courses in that language.

[4] May be taken first or second semester.

[5] The social studies requirement is twenty hours in history and twenty-one hours in social studies other than history. Hist. 151 may be taken to complete the Hist. 151-152 sequence. Students are also required to complete twelve to fourteen hours in advanced courses in history. In these, at least six hours must be offered in American history and at least six hours in European history (ancient, medieval, English, or modern). In the social studies other than history, the twenty-one hours of work should include at least one course in each of the following: economics, geography, political science, sociology. At least eight hours should be taken in each of two social studies fields: economics, geography, political science, sociology.

## Third Year

| | |
|---|---|
| Psych. 100—Introduction to Psychology | 4 |
| Science or Mathematics | 3 |
| Social Studies[1] | 5 |
| Speech 101—Principles of Effective Speaking[2] | 3 |
| Electives | 2 |
| *Total* | 17 |

| | |
|---|---|
| Any of the following:[3] | |
| D.G.S. 161—Literature and Fine Arts | 4 |
| Engl. 101—Introduction to Poetry | 3 |
| Engl. 111—Masterpieces of English Literature | 3 |
| Phil. 102—Logic | 3 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Social Studies[1] | 7 |
| Electives[4] | 2 or 3 |
| *Total* | 16 to 18 |

## Fourth Year

(Semesters are interchangeable.)

| | |
|---|---|
| Any of the following:[3] | |
| D.G.S. 162—Literature and Fine Arts | 4 |
| Engl. 102—Introduction to Drama | 3 |
| Engl. 112—Masterpieces of English Literature | 3 |
| Phil. 321—Ethics and Value Theory | 3 |
| Social Studies[1] | 9 |
| Electives | 3 |
| *Total* | 15 or 16 |

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Electives | 2 or 3 |
| *Total* | 14 or 15 |

## Fifth Year

*For the Degree of Master of Arts in the Teaching of Social Studies*

| | UNITS |
|---|---|
| Social Studies selected from not more than three of the following: economics, geography, history (at least two units), philosophy, political science, sociology | 4 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education | 1 |
| Electives | 1 |
| *Total* | 8 |

[1] The social studies requirement is twenty hours in history and twenty-one hours in social studies other than history. Hist. 151 may be taken to complete the Hist. 151-152 sequence. Students are also required to complete twelve to fourteen hours in advanced courses in history. In these, at least six hours must be offered in American history and at least six hours in European history (ancient, medieval, English, or modern). In the social studies other than history the twenty-one hours of work should include at least one course in each of the following: economics, geography, political science, sociology. At least eight hours should be taken in each of two social studies fields: economics, geography, political science, sociology.

[2] Students who take D.G.S. 111 and 112 in their freshman year are not required to take Speech 101.

[3] Second-year foreign language courses may be used to satisfy this requirement.

[4] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Desirable teaching combinations with social studies include art, commerce, English, French, German, home economics, industrial arts, Latin, mathematics, music, physical education, and Spanish.

## UNDERGRADUATE MINORS IN THE SOCIAL STUDIES

### Other Than History

For a minor in the social studies, other than history, a student must complete at least eight hours of work in each of two of the following subjects: economics, geography, political science, sociology. The minimum total required for a minor is sixteen hours.

All, or nearly all, students who earn this teaching minor will have earned teaching majors in the commercial subjects, which require eleven hours of economics, three of political science, three of economic or commercial geography, and eight of sociology. These courses satisfy the minimum requirement for teaching civics, community civics, economics, sociology, contemporary problems, and economic or commercial geography in the high school.

### Minor in History

For a minor in history, a student must complete five to six hours in advanced courses in American history, eight hours in general European history, and two to three hours in one of the following: English, ancient, medieval, or Latin American history. The minimum total required for a minor is sixteen hours.

## Curriculum Preparatory to the Teaching of Spanish

*For the Degree of Bachelor of Arts in the Teaching of Spanish*

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Copies of a sample curriculum in mimeographed form are available at 218 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1951 | 3 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 4 |
| Physical Education | 4 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in Spanish | 43 |
| Spanish 101-102—Elementary Spanish | 8 |

| | |
|---|---|
| Spanish 103-104—Intermediate Spanish | 8 |
| Spanish 201-202—Introduction to Spanish Literature | 6 |
| Spanish 211-212—Intermediate Composition and Conversation | 6 |
| Spanish 215—Spoken Spanish | 4 |
| Spanish 280—Teachers' Course | 2 |
| Spanish 331—La Cultura Española | 2 |
| Spanish 351—Phonetics, and Spanish 352—Syntax | 4 |
| Soc. Sci. 101 or 102—Latin American Civilization | 3 |
| Teachers' Minor | at least 16 |
| Minor teaching subjects which constitute desirable combinations with Spanish include English, Latin, and history. | |
| Electives | 11 or 10 |
| Recommended electives are art, English, history, music, rhetoric, and Spanish. | |
| *Total* | at least 120 |

### Fifth Year

*For the Degree of Master of Arts in the Teaching of Spanish*

The exact character of the work in the fifth year will be determined by the particular experience and needs of the individual student. Each program will be worked out in individual conferences between the adviser in the major field and the student.

| | UNITS |
|---|---|
| Spanish (middle group courses, one to two units; graduate courses, two to three units) | 4 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | 2 |
| *Total* | 8 |

## UNDERGRADUATE MINOR IN SPANISH

| | HOURS |
|---|---|
| Spanish 101-102—Elementary Spanish | 8 |
| Spanish 103-104—Intermediate Spanish | 8 |
| Spanish 113-114—Elementary Composition and Conversation | 6 |
| *Total* | 22 |

## Curriculum Preparatory to the Teaching of Speech

*For the Degree of Bachelor of Arts in the Teaching of Speech*

This program is designed to give the teacher a foundation in three areas of instruction: public speaking, theater arts, and remedial speech. The courses outlined below total 132 to 138 hours. A minimum of 128 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Speech 101—Principles of Effective Speaking | 3 | Speech 141—Oral Interpretation of Literature | 3 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 | Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Foreign Language[1] | 4 | Foreign Language[1] | 4 |
| Science or Mathematics[2] | 3 | Science or Mathematics[2] | 3 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| Electives[3] | 2 | Military (men) | 1 |
| *Total* | 16 to 18 | *Total* | 16 to 18 |

## Second Year

| | | | |
|---|---|---|---|
| Speech 161—Fundamentals of Acting | 3 | Speech 117—Argumentation | 3 |
| Foreign Language[1] | 4 | Psych. 100—Introduction to Psychology | 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 | Foreign Language[1] | 4 |
| Pol. Sci. 150—American Government | 3 | Hist. 152—History of the United States, 1865-1951 | 3 |
| English Literature Elective[4] | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Electives | 2 |
| *Total* | 16 or 17 | *Total* | 17 or 18 |

## Third Year

| | | | |
|---|---|---|---|
| Speech 157—Elements of Stagecraft | 4 | Ed. 240—Principles of Secondary Education | 2 |
| Speech 301—Introduction to Phonetics | 3 | Ed. 201—Foundations of American Education | 2 |
| English Literature Elective[4] | 3 | English Literature Elective[4] | 3 |
| Electives | 6 | Speech 221—Persuasion | 3 |
| | | Electives | 8 |
| *Total* | 16 | *Total* | 18 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Six semester hours of natural science are required. The courses in biological science and physical science in the Division of General Studies are especially recommended.

[3] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. In addition, beginning teachers of speech may need to complete a second teaching minor of sixteen semester hours.

[4] The following courses in English literature are especially recommended: Engl. 101, 102, 131, 281; Rhet. 246.

## Fourth Year

| | | | |
|---|---|---|---|
| Speech 208—Classroom Problems in Speech Correction | 3 | Ed. 211—Educational Psychology | 3 |
| Speech 255—Play Directing | 3 | Ed. 242—Educational Practice in Secondary Education[1] | 5 |
| Speech 375—Speech Science | 3 | Speech 247—Teaching of Speech[1] | 5 |
| Electives | 8 | Electives | 3 |
| *Total* | 17 | *Total* | 16 |

## Fifth Year

*For the Degree of Master of Arts in the Teaching of Speech*

### Public Speaking

| | UNITS | | UNITS |
|---|---|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| Speech 423—The Rhetoric of Aristotle | 1 | Ed. 302—History of American Education | ½ |
| Speech Elective | 1 | Ed. 303—Comparative Education | ½ |
| Electives | 1 | Ed. 304—Social Foundations of Education | ½ |
| | | One and one-half units chosen from the following: Speech 311—British Public Address; Speech 312—American Public Address; Speech 321—Modern Rhetorical Theory from 1700 to 1890 | 1½ |
| | | Speech 322—Modern Rhetorical Theory from 1890 to the Present | ½ |
| | | Electives | 1 |
| *Total* | 4 | *Total* | 4 |

### Theater Arts

| | UNITS | | UNITS |
|---|---|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| Speech 361—History of the European Theater to the Renaissance, or Speech 362—History of the European Theater from the Renaissance to 1900, or Speech 366—Development of the American Theater | 1 | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |
| Speech 452—Problems in Play Production in the School Theater | 1 | Speech 352—Theories of Play Production | 1 |
| Electives[2] | 1 | Speech 451—Problems in Play Directing in the School Theater | 1 |
| | | Electives[2] | 1 |
| *Total* | 4 | *Total* | 4 |

[1] May be taken during the first semester.
[2] Recommended electives are advanced courses in speech: Engl. 215, 281, 335, 336, 431.

## UNDERGRADUATE MINOR IN SPEECH

| | HOURS |
|---|---|
| Speech 101—Principles of Effective Speaking | 3 |
| Speech 117—Argumentation | 3 |
| Speech 141—Oral Interpretation of Literature | 3 |
| Speech 161—Fundamentals of Acting | 3 |
| Speech 204—Fundamentals of Speech for Teachers of English | 3 |
| Speech 301—Introduction to Phonetics | 3 |
| *Total* | 18 |

## Curriculum Preparatory to Speech Correction Work

*For the Degree of Bachelor of Science in Speech Correction*

The courses outlined below total 136 to 140 hours. A minimum of 128 semester hours of credit, not counting the first two years of military and physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 220) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 220) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Physiol. 103—Introduction to Human Physiology[1] | 4 | Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition[2] | 3 | Language[3] | 4 |
| Speech 105—Voice and Articulation | 2 | Psych. 103—Human Behavior[1] | 4 |
| Language[3] | 4 | Rhet. 102—Rhetoric and Composition[2] | 3 |
| Physical Education | 1 | Speech 102—Principles of Effective Speaking | 3 |
| Military (men) | 1 | Physical Education | 1 |
| Electives[4] | 3 | Military (men) | 1 |
| *Total* | 17 or 18 | *Total* | 17 or 18 |

[1] Chem. 101, Zool. 101, D.G.S. 131-132 or 141-142 may be chosen. Psych. 103 will be accepted in lieu of Psych. 100.

[2] In lieu of Rhet. 101 and 102 in the first year, followed by Speech 101 or 141 later, the student may elect D.G.S. 111-112 for four hours of credit each semester of the first year.

[3] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[4] Electives recommended are Speech 111, 117, 141, or another course approved by the adviser.

## Second Year

| | | | |
|---|---|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 | English[1] | 3 |
| English[1] | 3 | Hist. 152—History of the United States, 1865-1951 | 3 |
| Pol. Sci. 150—American Government | 3 | Physiol. 106—Physiology of the Nervous System and the Special Senses | 3 |
| Sociol. 100—Principles of Sociology[2] | 3 | Sociol. 110—Social Factors in Personality[2] | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives[3] | 3 | Electives[3] | 3 |
| *Total* | 15 or 16 | *Total* | 16 or 17 |

## Third Year

| | | | |
|---|---|---|---|
| Ed. 218—Remedial Reading in the Elementary School, or Ed. 219—Remedial Reading in the High School | 3 | Ed. 201—Foundations of American Education | 2 |
| Ed. 236—Child Development for Elementary Teachers | 3 | Ed. 230—Principles of Elementary Education | 2 |
| Speech 301—Introduction to Phonetics | 3 | Ed. 237—Child Development for Elementary Teachers | 3 |
| Speech 375—Speech Science | 3 | Ed. 317—Education of Exceptional Children | 3 |
| Speech 391—Introduction to Hearing Disorders | 3 | Speech 376—Speech Science | 3 |
| Electives[4] | 3 | Speech 393—Aural Rehabilitation | 3 |
| | | Electives[4] | 2 |
| *Total* | 18 | *Total* | 18 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 220—Educational Practice in the Education of Exceptional Children | 3 | Ed. 220—Educational Practice in the Education of Exceptional Children | 3 |
| Ed. 324—Mental and Educational Measurement of Exceptional Children | 3 | Psych. 338—Abnormal Psychology, or Psych. 150—Character and Personality | 3 |
| Speech 385—Speech Correction (with Laboratory) | 4 | Speech 388—Speech Correction (with Laboratory) | 4 |
| Speech 395—Audiometry and the Use of Hearing Aids | 3 | Electives[4] | 7 |
| Electives[4] | 5 | | |
| *Total* | 18 | *Total* | 17 |

## Fifth Year

*For the Degree of Master of Science in Speech Correction*

This program is designed for teachers who have completed a Bachelor of Science in Speech Correction at the University of Illinois or its equivalent at a recognized college or university, and who desire to obtain an advanced degree in speech correction.

Prerequisite for admission is the four-year curriculum preparatory to speech correction or its equivalent. Students who have not met all of the requirements of a four-year undergraduate curriculum but who desire to take the fifth year of work for a master's degree, may register on approval of the adviser, the Coordinator of Teacher Education, and the Dean of the Graduate College.

[1] At least six semester hours of English are required. The following courses are recommended: Engl. 101, 102; 111, 112; 113, 114; 121, 122; 131.

[2] D.G.S. 151-152, S.W.A. 220 or 221 may be chosen.

[3] Electives recommended are Speech 111, 117, 141, or another course approved by the adviser.

[4] Electives recommended are Lib. Sci. 303; S.W.A. 220, 221; P.E.W. 206; Psych. 135, 150; Home Econ. 205.

| | UNITS |
|---|---|
| Four units of speech selected from the following: | |
| Speech 383—Psychological Disorders of Speech | 1 |
| Speech 475—Experimental Phonetics I | 1 |
| Speech 476—Experimental Phonetics II | 1 |
| Speech 483—Seminar in the Psychology of Speech Disorders | 1 |
| Speech 486—Advanced Clinical Techniques in Speech and Hearing | 1 |
| Speech 488—Diagnosis of Speech Disorders | 1 |
| Speech 481—Seminar in Voice and Articulation Disorders | 1 |
| Speech 493 and 494—Research in Special Topics | 1 or 2 |
| Two units of education: | |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| One unit from the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Electives | 2 |
| *Total* | 8 |

Library School

Librarians Learn to Know Books Inside and Out

Library Students Consult with Faculty Member

# Library School

The purpose of the curriculum leading to the degree of Bachelor of Science is to give the student instruction in the fundamental principles and practices of librarianship, providing the basic preparation for his advanced professional studies in the fifth year. It should also provide him with an understanding of the nature and possibilities of library service and form the basis for his professional development.

## Requirements for Admission

Fifty-six hours of University work, not including military training and physical education, are required for entrance into the Library School. No specific course or sequence of courses must be presented for admission to the school, but students taking their preprofessional work at the University are advised to register in either the Division of General Studies or the general curriculum offered by the College of Liberal Arts and Sciences. Students in other colleges in the University are advised to follow the regular program in the college in which they are registered. A scholastic average of at least 3.5 for the first two years of work is required.

For undergraduates, entrance into the Library School is normally made at the beginning of the student's third year and no later than the beginning of the student's fourth year. Transfer students from other accredited institutions must meet the customary admission requirements of the University and will be admitted to the Library School under the same conditions and in the same manner as students from the University.

## Preprofessional Study

Because of the variety of opportunities in library service, the Library School will consider applications from students with many kinds of undergraduate specialization. A good general education, however, is a fundamental requirement. Foreign languages, literature, history, the social sciences, and the natural sciences are all important for the prospective librarian.

The knowledge of foreign languages which the student should acquire before entering the Library School varies with the type of library work in which he is interested. In some fields, such as school library service, foreign languages are relatively unimportant. For bibliographical work, reference, cataloging, and most types of work in college, university, and other scholarly libraries, a reading knowledge of two modern foreign languages, preferably French and German, is essential.

Every student should have a strong major in some academic field during his last two years of undergraduate work. As a general rule courses of a vocational nature should not be included in the program of study.

The Assistant Director of the School will be glad to answer any inquiries from prospective students regarding the type of preprofessional education best suited to their particular needs and interests.

## Requirements for Graduation

Each candidate for a baccalaureate degree in the Library School must meet the general University requirements with respect to registration, residence, fees, hygiene, military training, physical education, and rhetoric. He must also secure credit with a scholastic average of at least 3.5 in approved courses totaling at least 120 semester hours. This total may include the credit accepted for admission to the Library School, but not the first two years of the required work in military training and physical education.

### Prescribed Subjects

*Library Science Courses.* A minimum of eighteen hours in library science, chosen from the following courses: Lib. Sci. 201 (Use of Books and Libraries), 3 hours; Lib. Sci. 202 (Library in the Social Order), 3 hours; Lib. Sci. 251 (Organization and Operation of Libraries I), 3 hours; Lib. Sci. 252 (Organization and Operation of Libraries II), 3 hours; Lib. Sci. 301 (Literature of the Humanities and Social Sciences), 3 hours; Lib. Sci. 302 (Literature of Science and Technology), 3 hours; Lib. Sci. 303 (Library Materials for Children), 3 hours; Lib. Sci. 304 (Library Materials for Adolescents), 3 hours.

*Non-Library Science Courses.* By the end of the fourth year, students should have completed a basic introductory course in each of the following subjects: sociology, psychology, education, American government, public administration, and economics. Students should also note carefully the foreign language requirement for admission to the program leading to the degree of Master of Science in Library Science. All of these subjects may be counted either as electives or in computing the hours in the subjects of specialization which follow.

### Subjects of Specialization

Students must specialize in two subjects selected from the list below. Each student must complete at least twenty hours of approved courses in his major subject of specialization and at least sixteen hours of approved courses in his minor subject of specialization. In computing the hours in the subjects of specialization, courses taken in other colleges prior to admission may be counted. Other subjects not included in the following list may, if acceptable to the Library School, be offered toward meeting this requirement.

Subjects of specialization are: agriculture, art and architecture, biological sciences, business administration, chemistry, classics, economics, education, engineering, English, foreign languages, geography and geology, history, journalism, law, mathematics, musicology, philosophy, physical sciences, political science, psychology, sociology.

### Electives

The remainder of the curriculum may be elected from courses offered by other colleges and schools in the University as approved by the Director or Assistant Director of the Library School.

## Curriculum in Library Science

*For the Degree of Bachelor of Science in Library Science*

Each student's program is planned individually in consultation with the Assistant Director or another designated officer of the school. The student's special abilities and preprofessional training, his interests, and probable professional future form the basis for selecting his course of study.

Students entering the Library School in the third year will take in addition to their non-library courses the library science courses listed as follows:

### Third Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Lib. Sci. 201—Use of Books and Libraries | 3 | Lib. Sci. 202—The Library in the Social Order | 3 |

### Fourth Year

| | | | |
|---|---|---|---|
| Lib. Sci. 251—Organization and Operation of Libraries I | 3 | Lib. Sci. 252—Organization and Operation of Libraries II | 3 |
| Lib. Sci. 301—Literature of the Humanities and Social Sciences | 3 | Lib. Sci. 302—Literature of Science and Technology | 3 |

Students preparing for school or children's library work will follow the same program except they will substitute Lib. Sci. 303 (Library Materials for Children) for Lib. Sci. 301, and Lib. Sci. 304 (Library Materials for Adolescents) for Lib. Sci. 302.

Students entering in the fourth year will combine the third and fourth year programs taking three library science courses each semester.

## Graduate Work

For students who have received the degree of Bachelor of Science described above or who have taken its equivalent in undergraduate library science courses at other institutions and who meet the requirements for admission to the Graduate College, programs are arranged which lead to the degree of Master of Science in Library Science. Those students who do not have the necessary undergraduate credit may remove the deficiency in library science by attending the summer session prior to entrance into the Graduate College. The student's educational background and previous training will govern the selection of his courses. Each student will be encouraged to take a portion of his course work outside the Library School. At least two semesters in residence or the equivalent and the completion of nine units of graduate work are required. No thesis is required but each student will designate one of his regular course papers as his project for a master's degree.

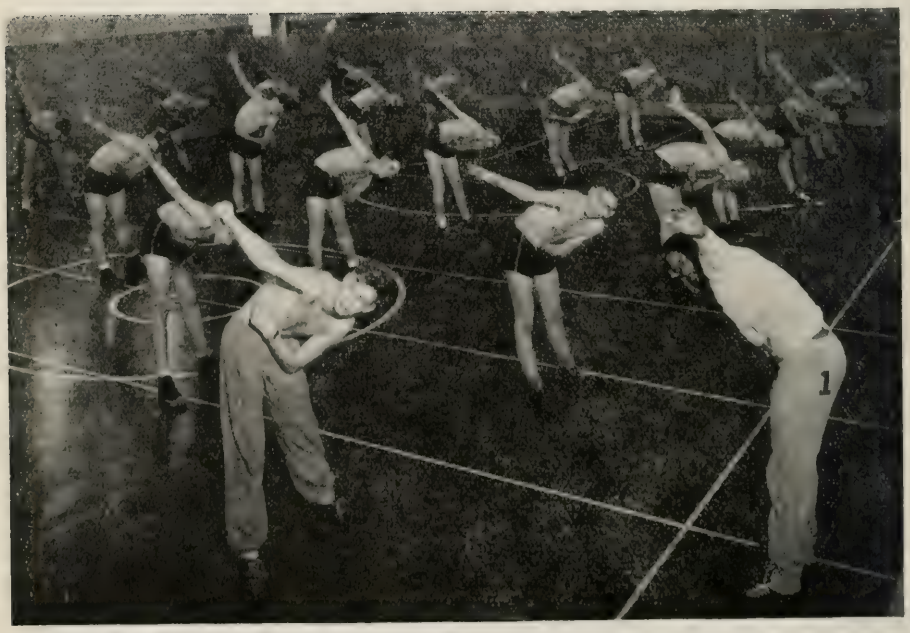
Students desiring to pursue a program of study and research leading to the degree of Doctor of Philosophy in Library Science must meet the customary admission requirements of the Graduate College. In addition the student must meet the following requirements of the Library School: (1) a master's degree in library science from an accredited library school or an equivalent acceptable to the Library School; (2) a substantial period of acceptable professional library experience. The normal minimum period of study required for securing the doctor's degree is two years beyond the master's degree, during which the student is required to devote all his working time to his studies. The degree is conferred, however, not for residence during a certain period, but for scholarly attainments and power of investigation, as proved by a thesis and examinations. All candidates for the degree of Doctor of Philosophy in Library Science must meet the regulations of the Graduate College concerning doctorate degrees.

Correspondence regarding admission to the graduate programs of the Library School should be addressed to the Assistant Director of the Library School who will supply the necessary application blanks. All applications, transcripts, and other necessary papers should be filed as early as possible, but not later than four weeks before the date of registration. No student should complete his plans for attending the Library School until he has been notified of his admission.

School of Physical Education

Women's Swimming Class

Exercise Class



# School of Physical Education

The School of Physical Education offers a service program in physical education as well as professional training curricula leading to the degrees of Bachelor of Science in Physical Education, in Health Education, and in Recreation. Advanced courses leading to the degrees of Master of Science in Health Education and in Physical Education and Doctor of Philosophy in Physical Education are offered in the Graduate College.

All students entering the University as freshmen (except veterans who are excused, but who may elect to take physical education) are required to obtain four hours of credit in physical education. Credit may be obtained by passing courses in physical education or by passing proficiency examinations which are offered at specified times by the department. Students assigned to prescribed exercise or basic physical fitness courses are not permitted to take proficiency examinations.

The service programs offered both men and women include a wide variety of courses designed to meet varying needs of the students. The chief purposes of these programs are: (1) correcting and ameliorating handicapping defects; (2) developing fundamental motor abilities; (3) developing organic power; (4) teaching recreational sports for life use; (5) developing an appreciation of physical fitness and sports.

The Athletic Association, closely affiliated with the School of Physical Education, sponsors numerous programs of intercollegiate and intramural sports for undergraduate men and other recreational sports for students and members of the faculty.

The Department of Physical Education for Women conducts an extensive program of intramural sports for women. Students are organized in voluntary inter-class and inter-house teams in hockey, soccer, bowling, basketball, volleyball, apparatus, swimming, baseball, and track and field athletics.

## Curriculum in Health Education

*For the Degree of Bachelor of Science in Health Education*

This curriculum is open to both men and women. A minimum of 130 hours of credit, counting physical education and the first two years of work in military training, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

## First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 | Chem. 132—Elementary Organic Chemistry | 3 |
| D.G.S. 111—Verbal Communication | 4 | D.G.S. 112—Verbal Communication | 4 |
| D.G.S. 131—Biological Science | 4 | D.G.S. 132—Biological Science | 4 |
| P.E.M. or P.E.W. 150—Professional Orientation | 2 | Hygiene 104—Personal and Community Hygiene | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| *Total* | 14 to 17 | *Total* | 14 or 15 |

## Second Year

| | | | |
|---|---|---|---|
| Home Econ. 120—Elementary Nutrition | 2 | Hist. 152—History of United States, 1865-1951 | 3 |
| Hygiene 110—Public Health | 2 | Physiol. 105—Physiological Anatomy | 5 |
| Physiol. 104—Physiological Anatomy | 5 | Psych. 100—Introduction to Psychology | 4 |
| Pol. Sci. 150—American Government | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | Electives | 4 |
| Humanities Elective | 2 | | |
| Electives[1] | 2 | | |
| *Total* | 17 or 18 | *Total* | 17 or 18 |

## Third Year

| | | | |
|---|---|---|---|
| Bact. 104—Introductory Bacteriology | 3 | Ed. 201—Foundations of American Education | 2 |
| Bact. 105—Introductory Bacteriology Laboratory | 2 | Ed. 240—Principles of Secondary Education | 2 |
| H.E. 280—Safety Education | 2 | H.E. 283—Physical and Health Inspection | 2 |
| H.E. 281—First Aid | 2 | H.E. 284—Driver Education | 2 |
| H.E. 282—Organization of School Health Programs | 3 | P.E.M. or P.E.W. 208—Theory of Prescribing Exercise | 3 |
| S.W.A. 225—Introduction to Social Work I | 3 | P.E.M. or P.E.W. 210—Inspection Trip | 0 |
| Electives | 2 | S.W.A. 226—Introduction to Social Work II | 3 |
| | | Electives | 3 |
| *Total* | 17 | *Total* | 17 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Ed. 334—Child Development and Implications for Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 | H.E. 287—Field Work in Community Health | 2 |
| Ed. 242—Educational Practice in Secondary Education | 5 | P.E.M. or P.E.W. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| H.E. 288—Principles of Health Education | 3 | Psych. 283—Psychology of Adjustment | 4 |
| | | Electives | 4 |
| *Total* | 15 | *Total* | 15 |

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours.

### Fifth Year

*For the Degree of Master of Science in Health Education*

The admission requirements to the graduate program in health education include a minimum grade-point average of 3.5 for all courses taken during the last two years of undergraduate study; thirty semester hours of approved undergraduate credit in health education or closely related courses; twenty-four semester hours of approved undergraduate credit in science; sixteen semester hours of undergraduate credit in education; and a course in tests and measurements or statistics. Students are not admitted on limited status.

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) health education or approved physical education courses, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Education, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of H.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis in health education, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in health education.

| | UNITS |
|---|---|
| H.E. 400—Foundations of Health Education | 1 |
| H.E. 401—Problems in Health Education | 1 |
| H.E. 402—Problems in Safety Education | 1 |
| H.E. 403—Problems in Public Health | 1 |
| H.E. 404—Trends and Issues in Social Hygiene | 1 |
| H.E. 490—Seminar | 0 |
| H.E. 491-492—Thesis | 1 to 2 |

## UNDERGRADUATE MINOR IN HEALTH EDUCATION

| | HOURS |
|---|---|
| H.E. 280—Safety Education | 2 |
| H.E. 281—First Aid | 2 |
| H.E. 282—Organization of School Health Programs | 3 |
| H.E. 283—Physical and Health Inspection | 2 |
| H.E. 287—Field Work in Community Health | 2 |
| H.E. 288—Principles of Health Education | 3 |
| Home Econ. 120—Elementary Nutrition | 2 |
| Hygiene 110—Public Health | 2 |
| *Total* | 18 |

## Curriculum in Recreation

*For the Degree of Bachelor of Science in Recreation*

This curriculum is open to both men and women. A minimum of 130 hours of credit, counting physical education and the first two years in military, is required for graduation.

## First Year

| FIRST SEMESTER | HOURS |
|---|---|
| Men | |
| P.E.M. 153—Physical Conditioning Programs | 2 |
| P.E.M. 154—Swimming | 2 |
| Military | 1 |
| Women | |
| P.E.W. 110, 111, or 112—Swimming | 1 |
| P.E.W. 151—Body Mechanics and Gymnastics | 1 |
| Electives | 3 |
| D.G.S. 131—Biological Science | 4 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| P.E.M. or P.E.W. 150—Professional Orientation | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| *Total* | 16 |

| SECOND SEMESTER | HOURS |
|---|---|
| Men | |
| P.E.M. 132—Archery | 1 |
| P.E.M. 135—Tennis | 1 |
| Military | 1 |
| Women | |
| P.E.W. 135—Archery | 1 |
| P.E.W. 152—Basketball and Softball | 1 |
| D.G.S. 132—Biological Science | 4 |
| Hygiene 110—Public Health | 2 |
| P.E.M. or P.E.W. 166—Games for Children | 2 |
| Rec. 174—Camp Counseling | 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| *Total* | 16 or 17 |

## Second Year

| | |
|---|---|
| Men | |
| Rec. 170—Outdoor Recreational Sports | 2 |
| Rec. 171—Indoor Recreational Sports | 2 |
| Military | 1 |
| Women | |
| P.E.W. 130—Badminton | 1 |
| P.E.W. 153—Soccer and Volleyball | 1 |
| Electives | 3 |
| Art 170—Recreational Crafts | 2 |
| H.E. 280—First Aid | 2 |
| Sociol. 100—Principles of Sociology | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Minor[1] | 2 |
| *Total* | 17 |

| | |
|---|---|
| Men | |
| P.E.M. 155—Gymnastics | 2 |
| P.E.M. 156—Track and Field | 2 |
| Military | 1 |
| Women | |
| P.E.W. 155—Bowling and Tennis | 1 |
| P.E.W. 165—Teaching of Swimming | 2 |
| Electives | 3 |
| Music 130—Recreational Music | 2 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rec. 176—Principles of Recreation | 3 |
| *Total* | 17 or 18 |

## Third Year

| | |
|---|---|
| Dance 235—Square and Social Dance | 2 |
| Ed. 211—Educational Psychology | 3 |
| Rec. 271—Organization of Sports Programs | 3 |
| Sociol. 332—Prevention and Treatment of Delinquency, or acceptable substitute in social studies | 3 |
| Speech 203—Dramatics for Teachers | 3 |
| Minor | 3 |
| *Total* | 17 |

| | |
|---|---|
| Bot. 306 or Zool. 306—Biology for Teachers | 3 |
| P.E.M. or P.E.W. 210—Inspection Trip | 0 |
| Rec. 270—Social Recreation Activities | 2 |
| Rec. 272—Organization of Aquatic Programs | 2 |
| Sociol. 375—Sociology of the Community, or acceptable substitute in social studies | 3 |
| Minor | 3 |
| Electives | 3 |
| *Total* | 16 |

[1] Students are required to complete one minor consisting of a minimum of sixteen hours.

### Fourth Year

| | | | |
|---|---|---|---|
| Rec. 275—Organization of Recreation Programs | 3 | Rec. 279—Recreation Field Work | 3 |
| Rec. 278—Recreation Field Work | 3 | S.W.A. 226—Introduction to Social Work II | 3 |
| S.W.A. 225—Introduction to Social Work I | 3 | Minor | 3 |
| Minor | 3 | Electives | 6 |
| Electives | 3 | | |
| *Total* | 15 | *Total* | 15 |

## Curriculum in Physical Education for Men

*For the Degree of Bachelor of Science in Physical Education*

A minimum of 130 hours of credit, counting physical education and the first two years of military, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Hygiene 104—Personal and Community Hygiene | 2 | Hygiene 110—Public Health | 2 |
| P.E.M. 150—Professional Orientation | 2 | P.E.M. 153—Physical Conditioning Programs | 2 |
| P.E.M. 151—Beginning Basketball | 2 | P.E.M. 154—Swimming | 2 |
| P.E.M. 152—Beginning Football | 2 | Physiol. 105—Physiological Anatomy | 5 |
| Physiol. 104—Physiological Anatomy | 5 | Speech 101—Principles of Effective Speaking | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Military | 1 | Military | 1 |
| *Total* | 17 | *Total* | 18 |

### Second Year

| | | | |
|---|---|---|---|
| Hist. 152—History of the United States, 1865-1951 | 3 | Psych. 100—Introduction to Psychology | 4 |
| P.E.M. 155—Gymnastics | 2 | Rec. 170—Outdoor Recreational Sports | 2 |
| P.E.M. 156—Track and Field | 2 | Rec. 171—Indoor Recreational Sports | 2 |
| Rec. 174—Camp Counseling | 3 | Rec. 176—Principles of Recreation | 3 |
| Military | 1 | Military | 1 |
| Humanities Elective | 2 | Teaching Minor | 5 |
| Teaching Minor[1] | 3 | | |
| *Total* | 16 | *Total* | 17 |

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen hours.

## Third Year

| | | | |
|---|---|---|---|
| H.E. 280—Safety Education | 2 | Ed. 201—Foundations of American Education | 2 |
| H.E. 281—First Aid | 2 | Ed. 240—Principles of Secondary Education | 2 |
| Pol. Sci. 150—American Government | 3 | H.E. 282—Organization of School Health Programs | 3 |
| Teaching Minor | 3 | P.E.M. 210—Inspection Trip | 0 |
| Electives | 6 | Teaching Minor | 3 |
| | | Electives | 6 |
| *Total* | 16 | *Total* | 16 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | P.E.M. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 | P.E.M. 206—Kinesiology | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 | Teaching Minor | 4 |
| P.E.M. 204—Organization of Physical Education | 3 | Electives | 5 |
| *Total* | 15 | *Total* | 15 |

## Fifth Year

*For the Degree of Master of Science in Physical Education*

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) physical education, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Education, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of P.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in physical education.

| | UNITS |
|---|---|
| P.E. 401—Problems in Physical Education | 1 |
| P.E. 404—Problems in Recreation | 1 |
| P.E. 406—Philosophy of Sport | 1 |
| P.E. 407—Sports Psychology | 1 |
| P.E. 450—Trends and Technics in Rehabilitation | 1 |
| P.E. 451—Scientific Foundations of Physical Fitness | 1 |
| P.E. 452—Scientific Analysis of Physical Education Activities | 1 |
| P.E. 453—Anthropometrical and Body Mechanics Research Technics in Health and Physical Education | 1 |
| P.E. 490—Seminar | 0 |
| P.E. 491-492—Thesis | ½ to 4 |
| P.E. 493-494—Research | ½ to 2 |
| P.E. 495—Technics of Research in Health, Physical Education, and Recreation | 1 |

## UNDERGRADUATE MINOR IN PHYSICAL EDUCATION FOR MEN

| | HOURS |
|---|---|
| H.E. 281—First Aid | 2 |
| H.E. 282—Organization of School Health Programs | 3 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| P.E.M. 204—Organization of Physical Education, or P.E.M. 208—Organization of Sports Programs | 3 |
| Electives (ten hours chosen from activity courses; four of these hours may be in service courses) | 10 |
| *Total* | 20 |

## Curriculum in Physical Education for Women

*For the Degree of Bachelor of Science in Physical Education*

A minimum of 130 hours of credit, counting physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 232 and 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 232 and 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| D.G.S. 131—Biological Science | 4 | Dance 160—Beginning Contemporary Dance | 1 |
| Hygiene 101—Health Lectures | 2 | D.G.S. 132—Biological Science | 4 |
| P.E.W. 110, 111, or 112—Swimming | 1 | P.E.W. 152—Basketball and Softball | 1 |
| P.E.W. 150—Professional Orientation | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| P.E.W. 151—Body Mechanics and Gymnastics | 1 | Speech 101—Principles of Effective Speaking | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Electives | 4 |
| Humanities Electives[1] | 3 or 4 | | |
| *Total* | 16 or 17 | *Total* | 16 |

### Second Year

| | | | |
|---|---|---|---|
| Dance 163—Analysis of Rhythmic Movement | 2 | P.E.W. 154—Tumbling and Apparatus | 1 |
| Hist. 152—History of the United States, 1865-1951 | 3 | P.E.W. 155—Bowling and Tennis | 1 |
| P.E.W. 153—Soccer and Volleyball | 1 | P.E.W. 166—Games for Children | 2 |
| Physiol. 104—Physiological Anatomy | 5 | Physiol. 105—Physiological Anatomy | 5 |
| Social Science Electives[2] | 4 | Pol. Sci. 150—American Government | 3 |
| Electives | 2 | Social Science Electives[2] | 3 or 4 |
| | | Electives | 2 |
| *Total* | 17 | *Total* | 17 or 18 |

[1] Recommended humanities electives: D.G.S. 121, 122; Engl. 101, 102, 111; foreign language.

[2] Recommended social science electives: Anthrop. 107; D.G.S. 151 and 152, or Sociol. 104 and 105; Geog. 104; Hist. 111, 112, 131, 132; Soc. Sci 112.

## Third Year

| | | | |
|---|---|---|---|
| Dance 235—Square and Ballroom Dance | 2 | Dance 236—Folk Dance | 1 |
| H.E. 281—First Aid | 2 | Ed. 201—Foundations of American Education | 2 |
| P.E.W. 200—Speedball and Hockey | 1 | Ed. 240—Principles of Secondary Education | 2 |
| P.E.W. 206—Kinesiology | 3 | P.E.W. 208—Theory of Prescribing Exercise | 3 |
| P.E.W. 213—Teaching of Sports | 4 | P.E.W. 210—Inspection Trip | 0 |
| Psych. 100—Introduction to Psychology | 4 | P.E.W. 214—Teaching of Sports | 4 |
| | | Electives | 4 or 5 |
| *Total* | 16 | *Total* | 16 or 17 |

## Fourth Year

| | | | |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Ed. 334—Child Development and Implications for Education | 2 |
| Ed. 232—Educational Practice in Elementary Education | 3 | H.E. 282—Organization of School Health Programs | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 | P.E.W. 202—Archery and Golf | 1 |
| Ed. 242—Educational Practice in Secondary Education | 3 | P.E.W. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| P.E.W. 201—Badminton | 1 | Rec. 270—Social Recreation Activities | 2 |
| P.E.W. 204—Organization of Physical Education | 3 | Electives | 4 |
| *Total* | 17 | *Total* | 15 |

## Summary

| | HOURS |
|---|---|
| Physical Education, Dance, and Recreation Courses, as prescribed | 41 |
| General Courses, as prescribed | 29 to 31 |
| Biological Science Teaching Minor,[1] as prescribed | 25 |
| Education Courses, as prescribed | 19 |
| Electives | 16 or 17 |
| *Total* | 130 |

## Fifth Year

*For the Degree of Master of Science in Physical Education*

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) physical education, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Education, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of P.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in physical education.

| | UNITS |
|---|---|
| P.E. 401—Problems in Physical Education | 1 |
| P.E. 404—Problems in Recreation | 1 |
| P.E. 406—Philosophy of Sport | 1 |

[1] The biological science teaching minor includes D.G.S. 131 and 132, 8 hours; H.E. 281 and 282, 5 hours; Hygiene 101, 2 hours; Physiol. 104 and 105, 10 hours. Students may substitute Bot. 100 and Zool. 101, 9 hours, or Bot. 100 and Zool. 104, 8 hours, for D.G.S. 131 and 132.

D.G.S. 131, 132, Bot. 100, Zool. 101, and 104 are not available at Navy Pier. Transfer students from the Pier getting a biological science minor may substitute Biol. 101 (4 hours) and 131 (5 hours).

| | |
|---|---|
| P.E. 407—Sports Psychology | 1 |
| P.E. 450—Trends and Technics in Rehabilitation | 1 |
| P.E. 451—Scientific Foundations of Physical Fitness | 1 |
| P.E. 452—Scientific Analysis of Physical Education Activities | 1 |
| P.E. 490—Seminar | 0 |
| P.E. 491-492—Thesis | 4 |
| P.E. 493-494—Research | ½ to 2 |
| P.E. 495—Technics of Research in Health, Physical Education, and Recreation | 1 |

## UNDERGRADUATE MINOR IN PHYSICAL EDUCATION FOR WOMEN

| | HOURS |
|---|---|
| Dance 235—Square and Ballroom Dance | 2 |
| H.E. 282—Organization of School Health Programs | 3 |
| P.E.W. 120, 121, or 122—Hockey, Soccer, or Speedball | 1 |
| P.E.W. 123 or 124—Basketball or Volleyball | 1 |
| P.E.W. 125 or 134—Softball or Tennis | 1 |
| P.E.W. 130, 132, or 135—Badminton, Bowling, or Archery | 1 |
| P.E.W. 151—Body Mechanics and Gymnastics | 1 |
| P.E.W. 166—Games for Children | 2 |
| P.E.W. 204—Organization of Physical Education | 3 |
| Rec. 270—Social Recreation Activities | 2 |
| P.E.W. or Dance Electives | 3 |
| *Total* | 20 |

## Curriculum in Dance

*For the Degree of Bachelor of Science in Physical Education*

A minimum of 130 hours of credit, counting physical education, is required for graduation.

Students who are enrolled during the spring semester of the year previous to the year they expect to do student teaching must file applications for admission to Educational Practice (Ed. 232 and 242) during the month of March in that semester. Transfer students and former students who are not enrolled during the spring semester must make application for admission to Educational Practice (Ed. 232 and 242) between September 15 and October 15 of the fall semester. Application forms may be obtained in the Office of Student Teaching.

### First Year

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Dance 160—Beginning Contemporary Dance | 1 | Engl. 102—Introduction to the Drama | 3 |
| Engl. 101—Introduction to Poetry | 3 | P.E.W. 110, 111, 112, or 113 (Swimming) | 1 |
| Hygiene 101—Health Lectures | 2 | P.E.W. 130, 131, 132, 133, 134, or 135 (Individual Sport) | 1 |
| Music 100—Rudiments of Theory | 2 | Rhet. 102—Rhetoric and Composition | 3 |
| P.E.W. 150—Professional Orientation | 2 | Speech 101—Principles of Effective Speaking | 3 |
| P.E.W. 120, 121, 122, 123, 124, or 125 (Team Sport) | 1 | Electives | 5 |
| Rhet. 101—Rhetoric and Composition | 3 | | |
| Electives[1] | 3 | | |
| *Total* | 17 | *Total* | 16 |

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours.

### Second Year

| | | | |
|---|---|---|---|
| Dance 162—Advanced Contemporary Dance | 1 | Dance 164—Dance Composition | 2 |
| Dance 163—Analysis of Rhythmic Movement | 2 | Dance 236—Folk Dance | 1 |
| Hist. 152—History of the United States, 1865-1951 | 3 | Physiol. 105—Physiological Anatomy | 5 |
| Physiol. 104—Physiological Anatomy | 5 | Pol. Sci. 150—American Government | 3 |
| Speech 161—Fundamentals of Acting | 3 | Rec. 270—Social Recreation Activities | 2 |
| Electives | 3 | Electives | 4 |
| *Total* | 17 | *Total* | 17 |

### Third Year

| | | | |
|---|---|---|---|
| Dance 235—Square and Ballroom Dance | 2 | Dance 243—Creative Rhythms for Children | 2 |
| Dance 241—Percussion | 2 | Dance 244—Teaching of Dance | 3 |
| Dance 245—Dance Production Workshop | 3 | Ed. 201—Foundations of American Education | 2 |
| P.E.W. 206—Kinesiology | 3 | Ed. 240—Principles of Secondary Education | 2 |
| Psych. 100—Introduction to Psychology | 4 | P.E.W. 208—Theory of Prescribing Exercise | 3 |
| Electives | 3 | Speech 157—Elements of Stagecraft | 4 |
| *Total* | 17 | *Total* | 16 |

### Fourth Year

| | | | |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Dance 240—Cultural Survey of Dance | 2 |
| Ed. 232—Educational Practice in Elementary Education | 3 | Dance 246—Theory and Philosophy of Dance | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Music 234—Musical Composition for Dance | 2 |
| Ed. 242—Educational Practice in Secondary Education | 3 | Phil. 101—Introduction to Philosophy | 3 |
| P.E.W. 204—Organization of Physical Education | 3 | Electives | 6 |
| *Total* | 15 | *Total* | 15 |

## UNDERGRADUATE MINOR IN DANCE

| | HOURS |
|---|---|
| Dance 160—Beginning Contemporary Dance | 1 |
| Dance 161—Intermediate Contemporary Dance | 1 |
| Dance 162—Analysis of Rhythmic Movement | 2 |
| Dance 164—Dance Composition | 2 |
| Dance 235—Square and Ballroom Dance | 2 |
| Dance 236—Folk Dance | 1 |
| Dance 241—Percussion | 2 |
| Dance 243—Creative Rhythms for Children, or Dance 244—Teaching of Dance | 2 or 3 |
| Dance 245—Dance Production Workshop, or Dance 246—Theory and Philosophy of Dance | 3 |
| P.E.W.—Individual Sports, Team Sports, or Swimming | 3 or 4 |
| *Total* | 20 |

Division of Social Welfare Administration

## Division of Social Welfare Administration

The Division of Social Welfare Administration offers a series of undergraduate courses intended to give the student a general orientation to the whole field of social work and some of its special divisions. Areas discussed in these courses include family welfare, child welfare, social group work, community organization, and the public social services. The undergraduate social welfare courses may be counted toward a minor in combination with other social sciences.

The student preparing for a career in social work should, during his undergraduate years, obtain a good general education, including a concentration of courses in the social sciences. Carefully selected courses in the fields of sociology, economics, political science, psychology, and history should acquaint the student with the nature of social organization, motivations of human behavior, the economic order, and the functioning of the different levels of government. Since skill in research is important to all social workers, a course in statistics should be included in the undergraduate program.

Recommended for all undergraduates interested in human welfare, the undergraduate sequence in Social Welfare Administration has proved especially useful for those who wish to explore the field of social work as a career before deciding on graduate work, and for those who will work with the handicapped or become ministers, teachers, or counselors in schools or industry. It is also helpful to the individual who upon return to his home community will become a member of committees and boards of social, religious, and civic agencies.

While the undergraduate course has not been made a requirement for entrance into the graduate program of the Division, it is recommended to all seniors intending to take professional training in social work.

Undergraduates may receive help with their academic plans by consulting the Division of Social Welfare Administration, 314 Lincoln Hall.

Division of Special Services for War Veterans

Learning Through Use of Visual Material

Veterans Studying Between Classes

# Division of Special Services for War Veterans

The Division of Special Services for War Veterans was established to meet the varied needs of the men and women who served in the armed forces, the auxiliary services, or the merchant marine of the United States or its allies after September 15, 1940, and prior to July 25, 1947. It is the agency through which the University helps the veteran begin or continue his education. It is a pioneering educational venture breaking traditional educational policies and allowing for such educational freedom as will serve the best interests of the veteran.

The Division attempts to discover and to meet the needs of the returning veteran. It supplies information to the veteran on the various services of the University, and will at his request help him to obtain the benefits which have been offered to him by the state and the nation. It helps him determine his educational aims and assists him in attaining them. It aids him in making educational adjustments. It guides him in his search for the curriculum which will best satisfy his needs, and helps him in arranging for modifications which he desires and which will be accepted by the University.

A veteran whose previous training has not fitted him for admission to the curriculum of his choice may register in the Division, subject to the admission requirements, and may take such courses as will enable him to meet the requirements for admission to that curriculum and to transfer into it when he is adequately prepared to pursue it. A veteran from another school or college may request transfer to the Division in order to bypass certain curriculum requirements and obtain his degree.

Because the Division of Special Services for War Veterans was established to aid the returning veteran student and the enrollment of veterans is decreasing, the activities of the Division are being curtailed. No student with less than eighty-six hours will be admitted to the Division after September 1, 1951, and no student will be accepted after June 15, 1952.

## Requirements for Admission

If a veteran meets the entrance requirements of the University, he may then apply for admission into the Division.

1. He must have served in the armed forces, auxiliary services, or merchant marine of the United States or its allies after September 15, 1940, and prior to July 25, 1947.
2. He will not be reinstated in the semester immediately following the one from which he has been dropped.
3. He will not be considered for transfer into the Division of Special Services if he has been dropped from a college more than twice, if he has thirty hours or more of "D," or if he has an American Council of Education score of less than the 35th percentile and is disapproved by the Testing Bureau.

Through the Director of Admissions of the University, the veteran can ascertain to what extent he may meet entrance or graduation requirements by credit for service or for courses taken through the United States Armed Forces Institute. Credit in military, physical education, and hygiene will be granted to any honorably discharged veteran who presents evidence that he has completed the basic training program in the Army, Navy, Marine Corps, or Coast Guard. Credit for work taken in college training programs, in technical schools, and in courses pursued while the veteran was in service may be transferred upon the basis of evaluation by the Director of Admissions at the University.

## Curricula

A great deal of freedom is granted in planning a specific curriculum for each student. For his first semester a fairly conventional program is worked out. During that semester he will be assisted, if he requests it, by the Testing Bureau, the Counseling Bureau, and the Division counselors in planning his four years. (For students under Public Law 16, this will be done by the Veterans Administration prior to enrollment.) In many cases, professional men in education, medicine, law, engineering, and so forth, are consulted.

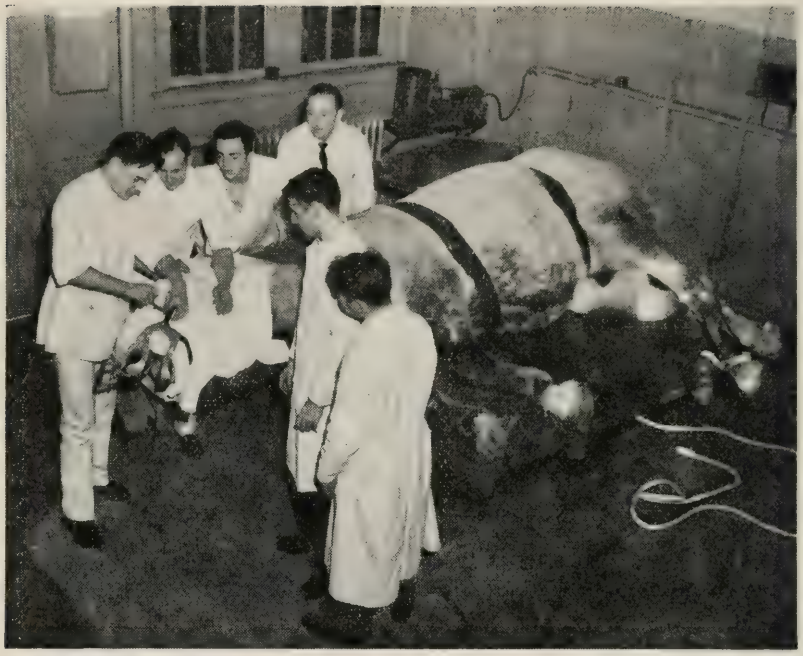
## Requirements for Graduation

In order to receive the degree of Bachelor of Science from the Division, a veteran must

1. Be enrolled in the Division at the time of graduation.
2. Have completed 128 hours of acceptable University credit.
3. Have fulfilled the University rhetoric requirement.
4. Have a minimum of eight hours in each of the following areas: humanities, sciences, social sciences.
5. Have satisfied a department major requirement or completed thirty-two hours in one area of study.
6. Have satisfied the University residence requirement.
7. Have maintained a grade of "C" or better in three-fourths of his credit hours and an average of 3.0 in total University work.

For further information, the veteran may address the Office of the Director of the Division of Special Services for War Veterans, 249 Armory, Champaign.

College of Veterinary Medicine



**A Diseased Molar Is Removed from a Horse While Students Watch to Learn the Proper Technique**

**The Scopicon Enables Students and Instructor to View Tissues Simultaneously**

# College of Veterinary Medicine

The College of Veterinary Medicine offers professional training in veterinary medicine and surgery. Men and women are trained to aid agriculture by the control of animal diseases and to protect the public health by the suppression and control of animal diseases communicable to man. These services to agriculture and public health require well-rounded educational and research programs that give students the maximum individual instruction and inspiring contacts with leaders in their chosen profession.

Two new buildings are planned to house the college. The science unit is under construction and scheduled for completion September, 1951. This unit provides staff offices, student laboratories, and classrooms for instruction in anatomy, histology, physiology and pharmacology, pathology, bacteriology, parasitology, food hygiene, and public health. Plans are being developed for the second unit to provide facilities for instruction in medicine, surgery, and obstetrics, and for hospitalizing animals.

The College of Veterinary Medicine has four academic departments: Anatomy and Histology, Clinical Medicine, Pathology and Hygiene, and Physiology and Pharmacology.

Two years of preveterinary instruction are required for admission. Preveterinary students may register in the College of Liberal Arts and Sciences (page 190), but equivalent preveterinary instruction may be taken at other recognized institutions.

The professional veterinary curriculum covers four years. The first two years are devoted largely to basic veterinary subjects including anatomy, physiology, bacteriology, parasitology, pharmacology, and pathology, while the last two years of the professional curriculum consist of instruction in clinical subjects such as medicine, surgery, and obstetrics. In keeping with modern trends in veterinary education, approximately two-thirds of the instruction in the fourth year is in clinical and laboratory practice in connection with the hospital and ambulatory clinics, where the student can apply knowledge gained in classroom and laboratory to the diagnosis, treatment, and prevention of animal diseases. Selected courses in animal science, dairy science, chemistry, bacteriology, food technology, and botany are required during the first three years.

Graduates in the professional curriculum will be trained in the science and practice of veterinary medicine at the level of the recent advances in medical science. Graduate veterinarians will be qualified for practice and for employment by federal and state agencies such as the United States Bureau of Animal Industry; by large corporations such as meat packers, milk companies, and manufacturers of serums and vaccines; by state, county, and municipal

livestock disease and regulatory agencies; by public health organizations; by the Federal Food and Drug Administration; by the Veterinary Corps of the Army; by national and state wildlife conservation agencies and zoological gardens; and by institutions of education and research.

Programs of graduate study leading to advanced degrees in veterinary pathology and hygiene are offered. Particular emphasis is placed on research fundamental to the nature, cause, treatment, and control of animal diseases. Graduate study in veterinary medicine qualifies students for assignments in veterinary research and clinical specialties.

The college is affiliated with the Agricultural Experiment Station and Extension Service in research and extension. It cooperates with the State Department of Agriculture in the laboratory diagnosis of animal diseases and in demonstrational programs of animal disease control, and with the State Natural History Survey in research on diseases of wildlife.

Inquiries pertaining to the curriculum in veterinary medicine and requests for other information concerning the college should be addressed to the Dean of the College of Veterinary Medicine, University of Illinois, Urbana.

## Requirements for Admission

Applicants for admission to the College of Veterinary Medicine must present not less than sixty semester hours of acceptable credit from a recognized college or university, exclusive of military training and physical education. The sixty semester hours must be distributed as follows:

| | HOURS |
|---|---|
| Chemistry (including organic and quantitative analysis) | 16 |
| Biological Science (botany and general zoology) | 8 |
| Physics (including laboratory) | 8 |
| Foreign Language | 6 |
| English Composition and Rhetoric | 6 |
| Electives in not less than two of the following fields: economics (including agricultural economics), fine arts, language, geography, history, literature, philosophy, political science, psychology, sociology, speech. Approximately one-half of these credits should be in the social sciences | 9 |
| Free Electives | 7 |
| *Total* | 60 |

Each applicant for admission to the College of Veterinary Medicine, whether from the University or from another institution, must have attained in his preveterinary work a scholastic average of not less than 3.5, or the equivalent as determined by the University for institutions using a different grading system. General University requirements with reference to scholarship of non-Illinois residents will apply.

In considering applications for admission, preference will be given to candidates who are residents of Illinois and to Illinois veterans. Students are admitted only by the Director of Admissions and Records. Whenever the number of qualified applicants exceeds the number which can be admitted, selection will be made by a Committee on Admissions composed of the Director of Admissions and Records and members of the faculty of the college appointed by the Dean.

## Requirements for Graduation

Students who have successfully completed the second year of the veterinary curriculum will be eligible for the degree of Bachelor of Science in Veterinary Medicine.

Students who have passed all courses in the veterinary curriculum and who have a minimum average of 3.0 will be eligible for the degree of Doctor of Veterinary Medicine.

# Curriculum in Veterinary Medicine

*For the Degree of Doctor of Veterinary Medicine*

### First Year[1]

| FIRST SEMESTER | HOURS | | SECOND SEMESTER | HOURS | |
|---|---|---|---|---|---|
| | *Credit* | *Clock* | | *Credit* | *Clock* |
| An. Sci. 102—Principles of Feeding | 3 | 3 | An. Nutr. 301—Introduction to Animal Nutrition | 3 | 3 |
| Chem. 350—Biochemistry | 5 | 11 | Bact. 104—Elementary Bacteriology, or Bact. 300—General Microbiology | 5 | 7 |
| V.A. 311—Gross Anatomy | 5 | 12 | D.S. 100—Introduction to Dairy Production | 3 | 4 |
| V.A. 313—Histology and Embryology | 5 | 12 | V.A. 312—Gross Anatomy | 5 | 12 |
| | | | V.A. 314—Histology and Embryology | 5 | 12 |
| *Total* | 18 | 38 | *Total* | 21 | 38 |

### Second Year

| | | | | | |
|---|---|---|---|---|---|
| An. Sci. 103—Breeds and Market Classes of Livestock | 5 | 8 | An. Sci. 305—Animal Genetics | 3 | 3 |
| An. Sci. 304—Poultry Management | 3 | 4 | V.P.H. 324—Parasitology | 5 | 9 |
| V.P.H. 323—Bacteriology and Immunology | 5 | 10 | V.P.H. 326—Special Pathology | 5 | 9 |
| V.P.H. 325—General Pathology | 5 | 9 | V.P.P. 322—Physiology | 4 | 7 |
| V.P.P. 321—Physiology | 4 | 7 | V.P.P. 329—Pharmacology | 3 | 3 |
| *Total* | 22 | 38 | *Total* | 20 | 31 |

### Third Year

| | | | | | |
|---|---|---|---|---|---|
| V.C.M. 331—Diseases of Small Animals | 5 | 5 | V.C.M. 334—Diseases of Large Animals | 5 | 5 |
| V.C.M. 333—Breeding Problems and Obstetrics | 5 | 7 | V.C.M. 336—Special Surgery | 5 | 7 |
| V.C.M. 335—General Surgery | 3 | 5 | V.C.M. 338—Clinical and Laboratory Practice | 2 | 8 |
| V.C.M. 337—Clinical and Laboratory Practice | 2 | 8 | V.P.H. 332—Principles of Sanitation in the Processing and Handling of Foods | 4 | 6 |
| V.P.P. 330—Pharmacology | 4 | 6 | Bot. 226—Poisonous Plants | 2 | 4 |
| *Total* | 19 | 31 | *Total* | 18 | 30 |

[1] Only those students who have completed sixty hours of semester credit as described on page 250 are eligible to begin the first year's work in the College of Veterinary Medicine.

## Fourth Year

| | | |
|---|---|---|
| V.C.M. 341—Infectious Diseases of Large Animals | 5 | 5 |
| V.C.M. 343—Radiology | 1 | 1 |
| V.C.M. 345—Seminar | 1 | 1 |
| V.C.M. 347—Clinical and Laboratory Practice | 8 | 32 |
| V.P.H. 349—Diseases of Poultry | 3 | 3 |
| *Total* | 18 | 42 |

| | | |
|---|---|---|
| V.C.M. 340—Jurisprudence, Business Methods, and Ethics | 3 | 3 |
| V.C.M. 346—Seminar | 1 | 1 |
| V.C.M. 348—Clinical and Laboratory Practice | 8 | 32 |
| V.P.H. 344—Food Hygiene and Public Health | 6 | 6 |
| *Total* | 18 | 42 |

## RESERVE OFFICERS' TRAINING CORPS

Army R.O.T.C.

Air Force R.O.T.C.

Naval R.O.T.C.

Aircraft Riveting Instruction

Gunnery Practice

## ARMY R.O.T.C.

Military training has been given at the University since its beginning in 1868 under the charter issued by the state of Illinois, and in compliance with the federal law which provided for the establishment of land-grant colleges. Since World War I, this training has been augmented and further defined under the provisions of the Acts of Congress of 1916 and 1920 commonly known as the National Defense Acts. Under these laws, the Reserve Officers' Training Corps at the University was organized to provide the required basic training and to offer advanced voluntary training on a selective plan. Its program of instruction is normally a part of the academic program of the University.

### Basic Course

The basic course R.O.T.C. constitutes a two-year course of instruction. This course fulfills the obligations of the University under the provisions of the Act of Congress known as the Morrill Act which was passed in 1862.

#### Requirements

All male students, unless specifically exempted under University rules, must register for military training and must take the full basic course, whether they intend to graduate or not. If credit is to be counted toward graduation, the scheduled basic course of two years must be successfully completed. The exempted students may take military work, if they so desire, by registering for it, except that a student who is not a citizen of the United States or a student who holds a commission or a certificate therefor, in the Officers' Reserve Corps, Air Force, Army, Navy, or Marine Corps will not be permitted to register.

#### Exemptions

1. Students over twenty-two years of age when entering the University.
2. Students entering the University with junior standing.
3. Students who are not citizens of the United States.
4. Students who have satisfactorily completed two years of military training in other senior units of the R.O.T.C.
5. Students holding commissions in the Officers' Reserve Corps, Army, Navy, Air Force, or Marine Corps.
6. Students who are certified by the University Health Officer to be physically disqualified for military work.
7. Students who have had one year of active military wartime service with any component of the Armed Forces.
8. Students enrolled in the N.R.O.T.C. or A.R.O.T.C. at the University.
9. Students who have successfully completed at least three years of training in accredited junior R.O.T.C. units are required to take only one year's training with a senior unit. Students in this category must submit petitions to obtain exemption.
10. Students who are members of federally recognized units of the National Guard

and are attending weekly drill meetings. Students must submit petitions for exemption under this category.

### Benefits

1. Students who successfully complete the basic course together with two years of college academic work will receive a Military Training Certificate signifying eligibility, if otherwise qualified, to enter an Army Officers' Candidate Course, or to enlist in the Enlisted Reserve Corps in the grade of Private 1st Class. A student who completes the basic course and one year of academic work receives a certificate of eligibility to enlist in the Enlisted Reserve Corps in the grade of Private 1st Class.

2. If the student applies for and is accepted for enrollment or continuance in the R.O.T.C. program, he may receive deferment from Selective Service. In applying the student must agree to complete the basic and advanced courses, to accept a commission, if tendered, and to serve on active duty for a period of not less than two years subject to call by the Secretary of the Army. The deferment remains in effect as long as the student maintains the necessary academic and military proficiency. Incoming freshmen are eligible to apply.

## Advanced Course

The advanced course R.O.T.C. is a two-year course of instruction leading to a commission as a Second Lieutenant in either the Regular Army, Air Force, or the Officers' Reserve Corps. Selected advanced course students may be designated "Distinguished Military Students." A student so classified may apply for a commission in the Regular Army, and since there are now no quotas limiting the number who may be so appointed from any single institution, opportunities to enter a military career from an R.O.T.C. background are excellent.

### Requirements

1. Students must not have reached twenty-seven years of age at the time of initial enrollment.
2. Students must be physically fit.
3. Students must have completed the basic course, senior division R.O.T.C., or have received credit for equivalent training which is approved by the Professor of Military Science and Tactics and the University.
4. Students must complete successfully such survey and general screening tests as may be prescribed.
5. Students must execute a written contract with the government to complete the advanced course (contingent upon remaining in school) and to attend the advanced summer camp at the time specified. Once entered upon by the student, the advanced course becomes a required part of his instructional course, completion of which is necessary for academic graduation.
6. Students must be selected by the Professor of Military Science and Tactics and the University.
7. Students must be enrolled in an academic field prescribed by the chief of a technical service if admission to a unit of a technical service is desired.

### Benefits and Allowances for Advanced Course Cadets

1. Commission either in the Regular Army or the Officers' Reserve Corps.
2. Deferment from Selective Service, if agreement is signed.
3. Officer-type uniform is furnished by the government.
4. Monetary allowance in lieu of subsistence of approximately $25 a month, and approximately $112 for attending the advanced summer camp.
5. Academic credit of three hours a semester.

## Units, Staff, and Equipment

Units of the R.O.T.C. at the Urbana Campus of the University are: Armor, Army Security Agency, Artillery, Corps of Engineers, Infantry, Ordnance Corps, Quartermaster Corps, Signal Corps, and Transportation Corps. There is a Medical Corps Unit and a Dental Corps Unit at the medical and dental colleges of the University in Chicago.

Army officers are detailed by the Department of the Army as instructors in the several units. The senior officer, as academic head of the University's Military Department, is Professor of Military Science and Tactics. In the military organization he is Commandant of Cadets. All other officers hold appropriate subordinate academic and military positions on his staff. An enlisted detachment is also assigned to assist with the instruction.

The equipment for military instruction is furnished by the Department of the Army. It includes the necessary training equipment such as uniforms, weapons, and matériel.

The Armory is located on the south campus and includes classrooms, storerooms, offices, and an enclosed drill floor 400 feet long and 200 feet wide and 100 feet high at the center of the arched roof. Near by are the drill fields and parade grounds.

# AIR FORCE R.O.T.C.

The Air Force R.O.T.C. program was initiated at Illinois at the beginning of the school year 1949-1950. Prior to this time students in the United States Air Corps R.O.T.C. program were under the jurisdiction of the Army R.O.T.C. program.

The Air Force program is similar to the Army program in that it offers the required basic training to all students and offers an advanced course of a voluntary nature which leads to a Reserve Commission in the Air Force Reserve or in the case of certain distinguished military students, a commission in the Regular Air Force.

## Basic Course

The basic course in the Air Force R.O.T.C. program is of two years duration and includes Air Force Science 111, 112, 113, and 114.

The sophomore year of Air Force Science is a prerequisite to the Air Force advanced program, and the two years together fulfill the obligation of the University in relation to the Morrill Act which was passed in 1862. Selected students who have completed the freshman year of Army or Navy R.O.T.C. may transfer to the Air Force R.O.T.C. for their sophomore year, with the permission of the heads of the deparments.

Selected students may be deferred from Selective Service.

### Requirements

All male students, unless specifically exempted under University rules, must register for military training and must take the full basic course, whether they intend to graduate or not. If credit is to be counted toward graduation, the scheduled basic course of two years must be successfully completed. The exempted students may take military work if they so desire, by registering for it.

### Exemptions

1. Students over twenty-two years of age when entering the University.
2. Students entering the University with junior standing.
3. Students who have satisfactorily completed two years of military training at other senior units of the R.O.T.C.
4. Students holding commissions in the Officers' Reserve Corps of the Army, Navy, Air Force, or Marine Corps.

5. Students who are certified by the University Health Officer to be physically disqualified for military work.

6. Students who have had one year of active military service with any component of the Armed Forces.

7. Students enrolled in the N.R.O.T.C. or Army R.O.T.C. at this University.

8. Students who have successfully completed at least three years of training in junior R.O.T.C. units are required to take only one year's training with a senior unit. Students in this category must submit petitions to obtain exemption.

9. Students who are members of federally recognized units of the National Guard or Air National Guard, and are attending weekly drill meetings. Students must file petitions for exemption under this category.

## Advanced Course

The advanced course is a two-year course of instruction with emphasis placed on two specialties, Air Force Administration and Aircraft Maintenance. Those students taking engineering work in the University are placed in the Aircraft Maintenance and Engineering section, while all other applicants for advanced training enroll in the Air Force Administration course.

### Requirements

1. Students must not have reached twenty-five years of age at the time of initial enrollment.

2. Students must be physically fit.

3. Students must have completed the basic course, senior division R.O.T.C. (Army, Navy, or Air Force), or have received credit for equivalent training which is approved by the Professor of Air Force Science and Tactics and the University. Veterans with one year or more of service are eligible to apply.

4. Students must complete successfully such survey and general screening tests as may be prescribed.

5. Students must execute a written statement with the government to complete the advanced course (contingent upon remaining in school), to attend the advanced summer camp at the time specified, and to accept an Air Force Reserve Officer's commission upon graduation. The summer camp is a concentrated laboratory of Air Force Science and Tactics.

6. Students must be selected by the Professor of Air Force Science and Tactics and the University.

7. The advanced course may not be pursued across graduation.

### Benefits and Allowances for Advanced Course Cadets

1. Commission in either the Regular Air Force or the United States Air Force Reserve.

2. Deferment from Selective Service.

3. Officer-type uniform is furnished by the government.

4. Monetary allowance in lieu of subsistence of approximately $27 a month and approximately $112 for attending advanced course summer camp of six weeks' duration between the junior and senior years.

5. Academic credit of three hours a semester.

## Staff and Equipment

Air Force officers are detailed by Air Force Headquarters as instructors in the Air Force R.O.T.C. Unit. The senior officer, as head of the Air Force Unit, is designated as Professor of Air Force Science and Tactics. He serves as Commandant of Air Force Cadets. All other officers hold appropriate subordinate academic and military positions on his staff. An enlisted detachment is also assigned to assist with the instruction.

Equipment for Air Force instruction is furnished by the Air Force with many training aids in the form of aircraft engines and equipment being available.

All classes are held in the Armory at the University of Illinois, which contains offices, classrooms, and a drill floor 400 feet long and 200 feet wide.

Further inquiry concerning the Air Force R.O.T.C. program at the University should be directed to the Professor of Air Force Science and Tactics, Air Force R.O.T.C., University of Illinois, Champaign, Illinois.

## NAVAL R.O.T.C.

The Naval Reserve Officers' Training Corps was established under authority of Section 22 of the Act of Congress of March 4, 1925, as amended (34 U. S. Code, Sup. 821; Public Law 729, 79th Congress). The purpose of the Naval Reserve Officers' Training Corps is to provide, by a permanent system of training and instruction in essential naval subjects at civil educational institutions, a source from which qualified officers may be obtained for the Navy, the Marine Corps, the Naval Reserve, and the Marine Corps Reserve.

The obligations of land-grant institutions to provide military instruction imposed by the Act of July 2, 1862 (12 Stat. 503:7 U.S.C. 304), are not altered by the enacting law authorizing the N.R.O.T.C., or by these regulations. The military training requirements prescribed by the above Act are considered to be fulfilled by students who have successfully completed two years of naval science courses and drills.

### Requirements for N.R.O.T.C. Students

A candidate for the N.R.O.T.C. must

1. Be a male citizen of the United States.
2. Have attained his seventeenth birthday on or before July 1 of the year of enrollment, and shall not have passed the twenty-first anniversary of his birth on that date. (If a minor, the candidate must have the consent of his parents or guardian at the time of his enrollment.)
3. Be physically qualified in accordance with current requirements detailed in the *Manual of the Medical Department, United States Navy.*
4. Be eligible for admission to the University.
5. Be and remain unmarried until commissioned.
6. Agree to:
   (a) Complete mathematics through trigonometry by the end of the second year unless such work is credited from secondary school.
   (b) Complete one year of college physics by the end of the second year. (For Regular Students only.)
   (c) Fulfill University requirements in written and oral expression.
   (d) Complete twenty-four semester hours of naval science.
   (e) Achieve proficiency as a swimmer.
   (f) Participate in required summer cruises.

The Naval Reserve Officers' Training Corps is now currently operating under the provisions of Public Law 729, Seventy-ninth Congress. This law is more generally known as the "Holloway Plan" and provides for the following three classes of N.R.O.T.C. students: Regular, Contract, and Naval Science.

**Regular.** Preliminary selection of the Regular student is based on results of a nationwide competitive examination conducted annually each fall, and the recommendation of an interviewing board which personally interviews the candidate. The final selection of the Regular student is made by a state selection committee consisting of three members—a prominent educator, a prominent citizen (from other than educational fields), and a senior naval officer (usually a professor of naval science). The Regular student undergoes a rigorous physical examination for which there are no waivers for defects.

When the candidate is notified that he is in all respects qualified, it is his responsibility to achieve admission to the N.R.O.T.C. college of his choice. In the case of Regulars who are appointed midshipmen in the United States Naval Reserve by the Secretary of the Navy, all costs of tuition, fees, and textbooks are paid by the government. Necessary uniforms are also provided by the government, and the Regular student receives retainer pay at the rate of $600 a year. Normally, students attend college for four years and may undertake any course leading to a baccalaureate degree, except predental, premedical, pretheological, preveterinary, pharmacy, music, art, and veterinary medicine. They must include twenty-four credit hours of naval science plus certain minimum requirements in other academic fields including mathematics through trigonometry, one year of college physics, and proficiency in written and oral expression. They wear the uniform only when engaged in drills or other naval activities prescribed by the professor of naval science; and, except for the ordinary requirements of gentlemanly conduct, they are subject to naval discipline only at those times.

The Regular student is required to make two summer cruises and to take one summer period of aviation indoctrination lasting from six to eight weeks each; and upon graduation he must accept a commission if offered as Ensign, U.S.N., or Second Lieutenant, U.S.M.C. After fifteen months to two years of active duty, he will be given the opportunity to serve an additional year and to apply for a permanent commission in the Navy or Marine Corps. If at any time he does not choose a career in the Navy or Marine Corps, he will be required to accept a commission in the Naval Reserve or Marine Corps Reserve. Such reserve commission must not be terminated prior to the sixth anniversary of the receipt of his first commission. Unless at his own request, a reserve officer is not called to active duty except during a war or a national emergency.

**Contract.** Contract students are normally limited to about ten per cent of the number of Regular students entering the N.R.O.T.C. program and are selected by the professor of naval science. The Contract student is a member of the N.R.O.T.C. but is not subsidized, except that the government allows him a subsistence during his third and fourth years. The amount of this subsistence varies, but the current rate is approximately one dollar a day. The Contract student is required to take only one cruise of from two-to-three weeks in duration. This cruise is normally made upon the completion of the third year. He receives the pay of the seventh enlisted pay grade during this cruise, the current rate of pay being $75 a month. With the exception of the cruise requirements and the requirement for one year of college physics, the Contract student must fulfill all other requirements of the Regulars. Upon graduation the Contract student is commissioned an Ensign, U.S.N.R., or Second Lieutenant, U.S.M.C.R. He may, upon his own application and if the Navy or the Marine Corps has need for his services, be ordered to active duty for a period of two years.

**Naval Science.** The Naval Science student is not a member of the N.R.O.T.C. and is not subsidized. A Naval Science student may not go on cruises, and any Naval Science course undertaken by him will count only as an academic subject. Naval science students are enrolled in numbers sufficient to fill the approved annual quota for N.R.O.T.C. units.

## Required Courses

### First Year[1]

| FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| N.S. 111—Naval History and Orientation | 3 | N.S. 112—Naval History and Orientation | 3 |

### Second Year[1]

| | | | |
|---|---|---|---|
| N.S. 121—Naval Weapons | 3 | N.S. 122—Naval Weapons | 3 |

[1] One course must be taken by the student each semester.

## Third Year[1]

| | | | |
|---|---|---|---|
| N.S. 231—Navigation | 3 | N.S. 232—Navigation | 3 |
| | | N.S. 291—History of the Art of War[2] | 3 |

## Fourth Year[1]

| | | | |
|---|---|---|---|
| N.S. 241—Naval Machinery and Diesel Engines | 3 | N.S. 242—Ship Stability, Naval Justice, and Leadership | 3 |
| N.S. 292—American Military History and Policy[2] | 3 | N.S. 293—Amphibious Warfare[2] | 3 |

The course in naval science is technical to the extent of covering technical subjects with sufficient detail to permit a graduate of the course to adapt himself quickly to any specific duty in the Navy that may be unexpectedly assigned to him. In addition, it furnishes a background of naval experience, tradition, and custom that is necessary for an officer going into duty in the Navy.

The course fosters and demands ideals of character such as integrity, discipline, self reliance, and cooperation which are essential to naval leadership. The association with experienced officers on the staff during the course permits close-knit cooperation in time of active service.

A staff of experienced naval officers is maintained at the University for the guidance and instruction of students. The professor of naval science and the assistant professors of naval science are appointed to the University faculty. The staff is authorized a quota of six commissioned officers (not more than two of whom will be Marines), six petty officers, U.S.N., and one non-commissioned officer, U.S.M.C.

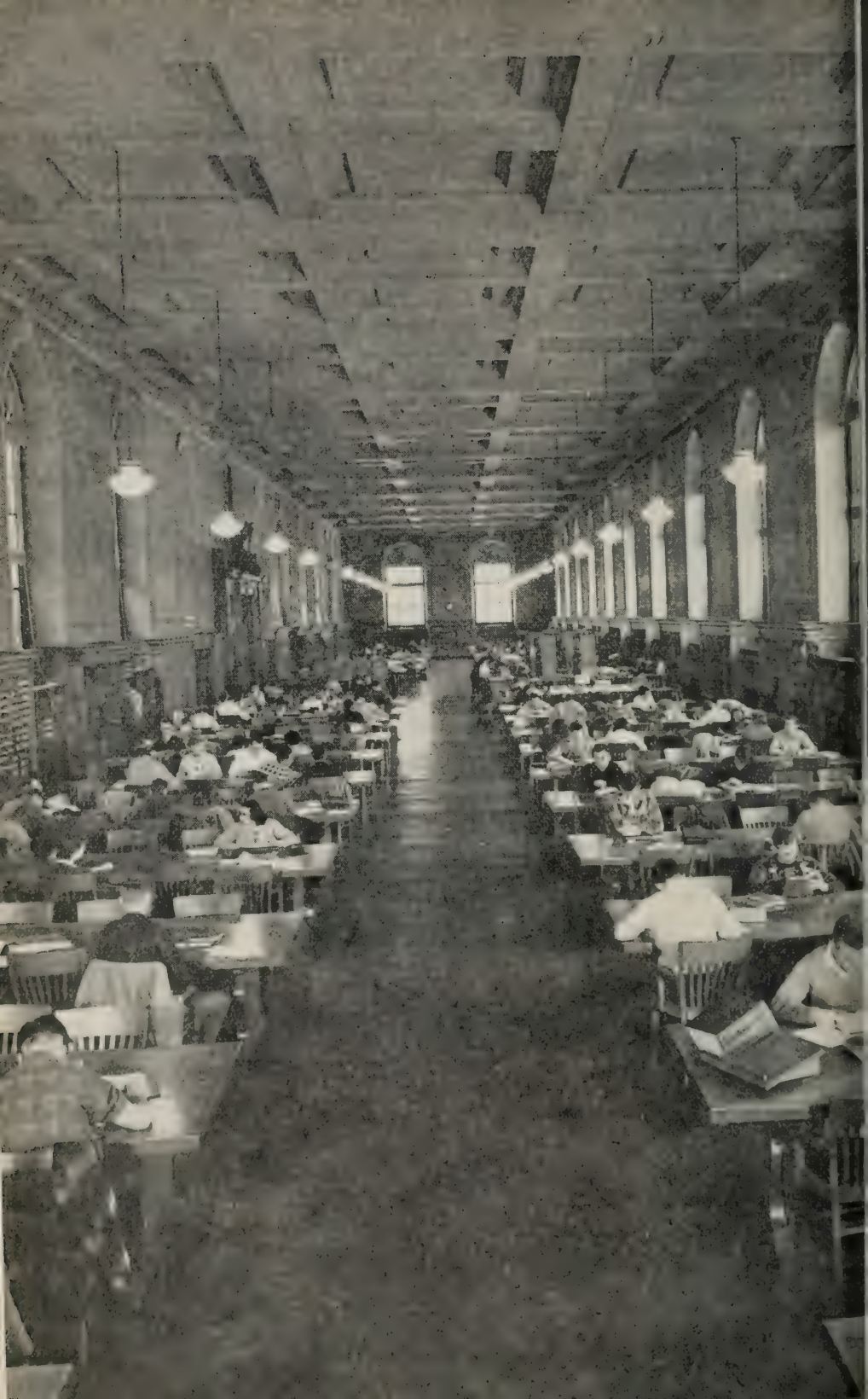
Currently, classes and instruction are conducted in the Armory. Equipment provided by the Navy Department is modern and reflects the latest developments of naval materials. Training aids provide instruction in the most recent methods of naval gunfire, antisubmarine warfare, radar search devices, signals, ship control, and ship damage control. Full use is made of visual and audio-training aids in keeping with the latest trend in educational principles in this field.

Students who desire more information and details should address correspondence to the Professor of Naval Science, N.R.O.T.C., University of Illinois, Urbana.

[1] One course must be taken by the student each semester.

[2] For Marine Corps candidates only. Marine Corps candidates substitute N.S. 291, 292, and 293 for N.S. 232, 241, and 242, respectively. In addition to these courses, N.R.O.T.C. students must also attend a two-hour laboratory period weekly.

# COURSES OF INSTRUCTION



# Courses of Instruction

The following list of undergraduate courses is arranged in alphabetic order of departments. The courses offered by each department are listed numerically in groups with headings to indicate the students for whom they are designed. Courses for undergraduates (freshmen and sophomores) are numbered 100 to 199; for advanced undergraduates (juniors and seniors), 200 to 299; and for advanced undergraduates and graduates (juniors, seniors, and graduates), 300 to 399.

Following the title of each course is a statement of the requirements, if any, for admission to the course. Special requirements for admission to certain courses are introduced by the word prerequisite. Terms of the year are represented by symbols: "S" for the summer term, "I" for the first semester, and "II" for the second semester.

Credit for undergraduate students is counted in semester hours. A semester hour represents the work of one classroom period of fifty minutes each week through one semester, or the equivalent in laboratory or field work. In descriptions of courses, "3" means three hours of credit each semester.

Students having ninety-five or more hours of credit, without regard to the division in which they may be enrolled, are classified as seniors for the purpose of designating those freshman courses which, when taken by seniors, will carry reduced credit.

Credit for graduate students taking courses numbered 300 to 399 is counted in units. A unit course requires approximately ten hours of time each week through one semester, irrespective of the distribution of that time in class work, laboratory or field work, and private study.

In registering for a course with variable credit, each student puts on his registration program the number of hours for which he intends to take the course.

## ACCOUNTANCY

(See Business Organization and Operation)

## AERONAUTICAL ENGINEERING

*Professors:* H. S. Stillwell (Head of Department), M. Z. Krzywoblocki, R. W. McCloy, J. M. Coan.

*Associate Professor:* P. Torda.

*Assistant Professors:* E. P. Eales (on leave), C. H. Fletcher.

*Instructors:* H. H. Hilton, A. I. Ormsbee.

## Courses for Advanced Undergraduates

201. **Aircraft Materials and Processes.** Physical and chemical properties of materials used in aircraft construction; thermal and chemical treatments of aircraft materials; forming and fabrication. I, II; 3. Prerequisite: Sophomore standing.

211. **Aerodynamics.** Fundamentals of aerodynamics as applied to the airplane. Introduction to the mechanics of perfect fluids; classical performance analysis; airplane stability. I, II; 3. Prerequisite: Mathematics 142; Theoretical and Applied Mechanics 156. ORMSBEE.

212. **Introduction to Aerodynamics of Real Fluids.** Introduction to the fundamentals of the theory of hydrodynamics as applied to real fluids. Attention is directed to solution of fluid flow problems in viscous-incompressible and inviscid-compressible fluids. I, II; 3. Prerequisite: Aeronautical Engineering 211. ORMSBEE, STILLWELL.

220. **Aircraft Structures.** Structural analysis as applied to aircraft. Beam deflection; unsymmetrical bending; moment distribution; introduction to shear flow. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 221 and 223. COAN, HILTON.

221. **Aircraft Structures.** Continuation of Aeronautical Engineering 220. Bending and torsional analysis of single and multicell structures. Analysis of tension field beam; columns; beam-columns; allowable stresses in thin metal structures. I, II; 3. Prerequisite: Aeronautical Engineering 220. COAN.

231. **Aircraft Power Plants.** A study of current and projected aircraft power plants from the standpoint of operation, efficiencies, construction; fuels and fuel systems; combustion; air compression; etc. I, II; 3. Prerequisite: Mechanical Engineering 205. MCCLOY, TORDA.

241. **Airplane Design.** Preliminary design of the airplane primarily from the aerodynamic standpoint; planning through to the three-view layout; weight and balance computation; fundamental dynamics of the airplane; airload distribution. I, II; 3. Prerequisite: Aeronautical Engineering 212. HILTON.

242. **Airplane Design.** Airworthiness requirements, stress analysis procedure, and design of the airplane structure. Introduction to problems in the dynamics of aircraft structures. I, II; 3. Prerequisite: Aeronautical Engineering 221 and 241. COAN.

261. **Aerodynamics Laboratory.** Experimental aerodynamics illustrating fundamental aerodynamic principles and basic wind tunnel testing techniques. I, II; 2. Prerequisite: Aeronautical Engineering 212. ORMSBEE, STILLWELL.

262. **Aircraft Engine Laboratory.** Evaluation of current aircraft power plants by means of experimental methods. I, II; 2. Prerequisite: Aeronautical Engineering 231. MCCLOY, TORDA.

264. **Aircraft Structures Laboratory.** Physical testing of aircraft components, use and calibration of instruments, tests showing accuracy of existing theory. I, II; 2. Prerequisite: Aeronautical Engineering 221. COAN, HILTON.

290. **Seminar.** Reports and discussions of recent developments in the fields of aerodynamics, aircraft power plants, aircraft structures, and aircraft maintenance and operation. I, II; 1. Prerequisite: Senior standing. COAN, MCCLOY, TORDA.

299. **Inspection Trip.** Visit to airplane manufacturing plants and research institutions. I; no credit. Prerequisite: Senior standing.

## Courses for Advanced Undergraduates and Graduates

311. **Aerodynamics of Perfect Fluids.** Fundamental equations, plane irrotational flow, vortex flow, combination fields of flow, Kutta-Joukowski theorem, application of conformal transformation to fields of flow, particle paths, fields of flow relative to axes fixed in fluid, velocity potential, three-dimensional fields. I; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212. KRZYWOBLOCKI.

312. **Aerodynamics of Real Fluids.** Characteristics of viscous and compressible fluids, including boundary layer theory, surface friction drag, turbulence, and two-dimensional subsonic and supersonic flows. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212. KRZYWOBLOCKI.

314. **Airplane Performance.** The performance of conventional and unconventional aircraft developed on basic physical principles with additional empirical modifications where practical. Special attention is given to problems and methods of solution found in the industry. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 211. STILLWELL.

316. **Stability and Control.** An introduction to dynamics of the airplane, airplane control, and airplane maneuverability. I; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 211; Mathematics 341 or 345. ORMSBEE.

318. **Airplane Propellers.** Propeller blade action theory; aerodynamic propeller testing; effect of the propeller on airplane performance; blade design and stress analysis. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212; Theoretical and Applied Mechanics 221. STILLWELL.

320. **Indeterminate Aircraft Structures.** Virtual work and least work methods; analysis of fuselage rings and frames; indeterminate unsymmetrical space frameworks; application of energy methods to buckling of non-uniform columns. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 221. COAN.

331. **Combustion, Fuels, and Lubricants.** A study of the phenomena of combustion and combustion calculations; characteristics of fuels and lubricants for reciprocating engines, air-breathing jets, and rockets. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 205. MCCLOY.

332. **Aircraft Power Plant Design.** The aerodynamic and thermodynamic design of aircraft power plants including reciprocating engines, turbo jets, pulse jets, ram jets, and rockets. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 231 and 331. MCCLOY, TORDA.

341. **Aircraft Component Design.** Design and analysis of aircraft hydraulic, electrical, pneumatic, mechanical, de-icing, and cabin atmospheric control systems. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 222; Electrical Engineering 202 and 203. STILLWELL.

391. **Special Problems.** Special problems relating to the theory, design, testing, operation, maintenance, or production of airframes or aircraft power plants. I; 2 to 4 hours, or ½ to 1 unit. Prerequisite: Senior standing in engineering; consent of instructor. COAN, KRZYWOBLOCKI, MCCLOY, STILLWELL, TORDA.

392. **Special Problems.** Special problems relating to the theory, design, testing, operation, maintenance, or production of airframes or aircraft power plants. II; 2 to 4 hours, or ½ to 1 unit. Prerequisite: Senior standing in engineering; consent of instructor. COAN, KRZYWOBLOCKI, MCCLOY, STILLWELL, TORDA.

393. **Theoretical Problems in Aeronautical Engineering.** This is a course flexible in specific content and providing an opportunity for broadening the student's understanding of analytical methods. Topics from the fields of aerodynamics, structures, mechanics, and propulsion will be chosen according to the student's interests and needs. I; 3 hours, or ½ unit. Prerequisite: Senior standing; consent of instructor. HILTON, ORMSBEE, TORDA.

## AGRICULTURAL ECONOMICS

*Professors:* H. C. M. CASE (Head of Department), J. B. ANDREWS, R. C. ASHBY (Emeritus), R. W. BARTLETT, H. W. HANNAH, R. R. HUDELSON, P. E. JOHNSTON, G. L. JORDAN, D. E. LINDSTROM, J. W. LLOYD (Emeritus), M. L. MOSHER (Emeritus), L. J. NORTON, R. C. ROSS, C. L. STEWART, E. J. WORKING.

*Associate Professors:* J. B. CUNNINGHAM, E. H. REGNIER, L. H. SIMERL, L. F. STICE, R. H. WILCOX, J. E. WILLS.

*Assistant Professors:* A. T. Anderson, W. D. Buddemeier, C. L. Folse, T. A. Hieronymus, R. A. Kelly, M. W. Madison, R. J. Mutti, F. J. Reiss, F. A. Stewart, W. N. Thompson, G. B. Whitman, W. J. Wills.

*Assistants:* R. J. Becker, Janice E. Beckstrom, E. E. Broadbent, L. D. Erlewine, W. J. Foreman, D. K. Freebairn, A. G. Harms, W. H. Heneberry, R. A. Hinton, A. E. Idleman, G. C. Kleiman, N. G. P. Krausz, A. G. Mueller, J. S. St. Clair, F. M. Schrader, C. P. Schumaier, J. S. Shelly, L. G. Sleight, R. C. Smith, E. R. Swanson, R. N. Van Arsdall, V. I. West, W. Yonts.

## Courses for Undergraduates

100. **Introductory Agricultural Economics.** Historical basis of current farm problems; relation of production to domestic and foreign demand; marketing, prices, finance, taxation, farm records; social relationships. I, II; 3. No credit given to juniors and seniors. Ross and others.

111. **Agricultural Economies of Latin American Countries.** Agricultural products and producing regions; land used in agriculture and forestry, its ownership and operation; technological advances in farm and ranch operations; agricultural communities; impact of corporate developments for export production; opportunities for agricultural service; the place of agriculture in hemispheric and world solidarity. I; 3. Prerequisite: Sophomore standing. Stewart.

120. **Farm Management.** Principles of farm organization and operation for conservation of resources and profit; farmstead arrangement; interpretation of farm records; tenure and types of leases; home farm problem. Field trips required; estimated expense, $2. I, II; 3. Prerequisite: Sophomore standing. Johnston.

130. **Marketing of Agricultural Products.** Methods followed and agencies engaged in marketing farm products; services performed; factors affecting prices; market channels used in ways of lowering costs. I, II; 3. Prerequisite: Sophomore standing. Hieronymus, Mutti.

177. **Farmers' and Rural Organizations.** A study of the field of farmers' and rural organizations; their historical background and development; their systems, programs, work, comparative functions, and guiding processes; and their relation to national policy and rural welfare. Field trip to be arranged; estimated expense not to exceed $5. II; 3. Prerequisite: Sophomore standing. Lindstrom.

## Courses for Advanced Undergraduates

200. **Problems in Agricultural Economics.** Individual research work with senior members of the department in the following fields: (a) agricultural marketing; (b) agricultural prices and statistics; (c) farm management; (d) land economics; (e) rural organization. Students may also receive credit in this course for directed research done in preparation for intercollegiate debating on agricultural economic problems. I, II; 3 to 5. Prerequisite: Approval of head of department. Staff.

201. **Economic Relationships of Agriculture.** Changes affecting the place of farming in American life; the changing place of American agriculture in world economy. I; 3. Prerequisite: Economics 102 and 103, or 108. Offered in 1951-1952 and in alternate years. Stewart.

203. **Agricultural Law.** Relation of common law principles and statutory law to problems of land tenure, farm tenancy, farm labor, and farm management. I, II; 3. Prerequisite: Senior standing. Hannah.

218. **Land Economics.** Farm land prices, rents, taxes, tenancy, transfer; procedures in purchasing and improving land, aiding conservation, and promoting sound land use. II; 3. Prerequisite: Economics 102 and 103, or 108. Stewart.

224. **Farm Operation.** Operating costs in farming, analysis of farm jobs, farm work simplification, selecting power units and equipment for economical operation. Field trips; estimated expense, $2. II; 3. Prerequisite: Agricultural Economics 120. J. E. WILLS.

277. **Rural Sociology.** Same as Sociology 277. A study of the importance of rural life, its social problems and means of solution. The importance of a scientific study of these factors concentrating primarily on the social aspects of physical conditions, population, occupations, the family, the neighborhood, community organizations, the church, the school, the library, adult education, local government, recreation, country life movements, and possible future trends affecting rural life. Field trip to be arranged; estimated expense not to exceed $5. I, II; 3. FOLSE, LINDSTROM.

## Courses for Advanced Undergraduates and Graduates

302. **Financing Agriculture.** Capital and credit needs of farmers; agencies supplying credit needs; problems of borrowers and lenders. II; 3 hours, or ½ unit. Prerequisite: Economics 102 and 103, or 108. NORTON.

305. **Agricultural Development and Policies.** Agricultural development in the United States presented as a basis for analyzing the effectiveness of past agricultural policies, delineating agricultural problems, and the need of developing sound agricultural policies in keeping with a sound national economy. I; 3 hours, or ½ to 1 unit. Offered in 1952-1953 and in alternate years. CASE.

312. **Farm Appraisals.** Same as Agronomy 312. Valuation of farm real estate; soils, crops, management, buildings, drainage, land titles, prices, and taxes in relation to value. Local field trips; estimated expense, $5. II; 5 hours, or 1 unit. Prerequisite: Agronomy 201 and Agricultural Economics 120, or equivalent. HUDELSON and others.

325. **Advanced Farm Management.** Planning the farm business for soil conservation and profit; fitting the livestock organization to the kind of crops produced and to market outlets; economic information for farm planning; measures of farm efficiency; labor and power problems. Field trips to study successful farms; estimated expense, $5. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 120. BUDDEMEIER, JOHNSTON.

331. **Grain Grading and Marketing.** Same as Agronomy 331 and Marketing 331. Factors affecting the quality of grain crops; standards employed in their classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

332. **Marketing Livestock.** Same as Marketing 332. Livestock market practice as applied in current marketing operations. II; 2 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or consent of instructor. W. J. WILLS.

333. **Marketing Horticultural Products.** Same as Horticulture 333 and Marketing 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or twelve hours of horticulture. KELLY.

334. **Marketing Dairy Products.** Same as Dairy Science 334 and Marketing 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

341. **Agricultural Statistics.** Statistical methods with special applications to agricultural problems, including price behavior. Students receiving credit in this course will not receive credit in Agriculture 216. I; 3 hours, or ½ unit. JORDAN.

342. **Agricultural Prices.** A study of the factors affecting prices of agricultural products; long-time, cyclical, seasonal, and other price movements; sources of information relating to production and demand factors; government activities as they relate to prices of agricultural products and problems in price analysis and forecasting. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. JORDAN.

## AGRICULTURAL EDUCATION

(See Education)

## AGRICULTURAL ENGINEERING

*Professors:* E. W. LEHMANN (Head of Department), D. G. CARTER, R. I. SHAWL.
*Associate Professors:* R. C. HAY, K. H. HINCHCLIFF, G. E. PICKARD, A. L. YOUNG.
*Assistant Professor:* F. W. ANDREW.
*Associates:* H. P. BATEMAN, J. H. RAMSER.
*Instructors:* A. R. AYERS (on leave), J. O. CURTIS, W. F. LYTLE (on leave), J. W. MATTHEWS, R. W. MOWERY, B. F. MUIRHEID.
*Assistants:* P. L. BENFIELD, A. C. BIANCHINI, J. T. CLAYTON, E. R. COON, M. R. HODGELL, E. J. MONKE, C. F. SAUER, J. H. THOMAS, J. A. WEBER, D. WINTER, S. P. YOUNG.

### Courses for Undergraduates

101. **Introduction to Agricultural Engineering.** Agricultural problems involving application of engineering knowledge and methods; land engineering, power and machinery, buildings and equipment. Lectures, recitations, and laboratory. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. MOWERY, YOUNG.

111. **Farm Structures and Soil and Water Conservation.** Principles of plan, construction, and adaptation of structures to farm needs; study of drainage, soil erosion control, and water conservation on farms. For vocational agriculture majors and agricultural engineers. Lectures, discussion, and laboratory. I, II; 3. Students with credit in Agricultural Engineering 252 or 272 will not receive credit in this course. Prerequisite: Sophomore standing. CURTIS, HAY.

112. **Tractors and Field Machinery.** The design, construction, and application of gas engines, tractors, and field machinery. For vocational agriculture majors and agricultural engineers. Lectures, quiz, and laboratory. Inspection trip; estimated expense, $3. I, II; 3. Students with credit in Agricultural Engineering 131 or 142 will not receive credit in this course. Prerequisite: Sophomore standing. SHAWL.

131. **Field and Power-Driven Machinery.** Theory of design and construction; operation and management of machines for soil and feed preparation; seeding, cultivating, and harvesting. Lectures, recitations, and laboratory. I; 3. Students with credit in Agricultural Engineering 112 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101. SHAWL.

142. **Gas Engines and Tractors.** Theory of construction and operation of engines, timing, ignition, carburetors; fuels, carburetion, lubrication, cost of operation, and trouble work. Lectures, recitations, and laboratory. Inspection trip; estimated expense, $10. II; 3. Students with credit in Agricultural Engineering 112 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101. SHAWL.

## Courses for Advanced Undergraduates

**201. Farm Shop Work.** Special ten-week course for practice teachers. Farm machinery and equipment repairs, construction jobs, care of tools, electric wiring, welding, metal work. Recitations and laboratory. I, II; 3. Prerequisite: Agricultural Engineering 111 and 112, or consent of instructor. MATTHEWS.

**204. Spraying.** Same as Horticulture 204. A study of spray materials and equipment used for control of insects and diseases on horticultural crops. II; 3. Prerequisite: Horticulture 142 or 161, Chemistry 101 or 102, Agricultural Engineering 101, or consent of instructor. Offered in alternate years. POWELL.

**241. Electric Power for the Farm.** Utilization of electricity in agriculture for power, heat, and light; types of motors and typical applications, water pumping, hay curing, feed processing; heating and lighting applications; circuits and wiring. Lectures, discussions, and laboratory. I; 3. Prerequisite: Agricultural Engineering 101, or equivalent. MOWERY.

**242. Advanced Gas and Diesel Engines and Tractors.** Principles of design, construction, and assembly; belt horsepower ratings, starting and lighting systems, lubricants, fuels, and modern shop methods used in repair and checking. Lectures, discussions, and laboratory. I; 3. Prerequisite: Agricultural Engineering 112 or 142. SHAWL.

**252. Mechanics of Soil and Water Conservation.** Principles of planning and constructing. Adoption of soil conservation and drainage practices for Illinois farms, and the application of surveying to these practices. Lectures, field work, and laboratory. II; 3. Students with credit in Agricultural Engineering 111 receive only 2 hours credit. HAY.

**262. Farmstead and Home Equipment.** Equipment for modernizing the farm home—principles, definitions, and problems as they relate to water supply, plumbing, sewage disposal, heating, fuels, refrigeration, air conditioning, and lighting. Lectures, discussions, and laboratory. II; 3. Prerequisite: Junior standing in agricultural engineering, or consent of instructor. LEHMANN, MOWERY.

**272. Farm Buildings.** Requirements of farm buildings, problem analysis and planning; plans, materials, construction methods, and costs. Lectures, discussions, and laboratory. II; 3. Students with credit in Agricultural Engineering 111 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101, or consent of instructor. CARTER, CURTIS.

**299. Inspection Trip.** I; no credit. Prerequisite: Senior standing in agricultural engineering.

## Courses for Advanced Undergraduates and Graduates

**331. Function, Application, Adjustment, and Management of Farm Machinery.** A study of field and farmstead machinery as related to the needs of agricultural production, systems of farming, function, construction, maintenance, and operation cost. S; 3 hours, or ½ unit. Prerequisite: Agricultural Engineering 112 or 131, or consent of instructor. Offered in alternate years. MATTHEWS, SHAWL.

**332. Design of Agricultural Machinery.** Survey of needs and requirements, layout of design, cost comparison, and study of production problems. II; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 271. PICKARD.

**341. Farm Power.** Basic theory, analysis, and testing of internal combustion engines, gasoline and diesel, together with study of other elements of farm tractors. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 202. PICKARD.

**351. Hydraulics of Soil and Water Conservation.** Studies of watersheds, runoffs, cross sections of gullies; capacities of structures, terraces, and terrace outlets; design of structures; constructing terraces; machines used in erosion control; estimating costs and benefits of various methods of control. I; 3 hours, or ½ unit. Prerequisite: Civil Engineering 115; Theoretical and Applied Mechanics 232 and 234; senior standing in agricultural engineering, or consent of instructor. HAY.

355. **Advanced Soil and Water Conservation Practices.** A study of conservation practices and their evaluation in relation to farm operations. Planning, constructing, and checking of terraces, waterways, diversion ditches, and drainage systems. S; 3 hours, or ½ unit. Prerequisite: Agricultural Engineering 111 or 252, or consent of instructor.

361. **Development and Function of Family Housing.** Same as Home Economics 361. Study of principles and problem solutions in family housing. Basic functions, plan patterns, types, materials, and structures; economic influences, costs, and adaptations; personal and public interests. Lectures, discussions, and problems. II; 3 hours, or ½ unit. CARTER.

371. **Advanced Farm Structures.** I; 3 hours, or ½ unit. Prerequisite: Theoretical and Applied Mechanics 221 and 223; Civil Engineering 261; senior standing. CARTER.

393. **Special Problems.** Each student chooses a special problem for design, laboratory, or field work, with library research. Work may be taken in two of the following subjects: drainage and soil erosion control, farm buildings, farm housing, farm power, farm machinery, rural electrification. I, II; 3 hours, or ½ unit. Prerequisite: Senior standing; approval of head of department. STAFF.

## AGRICULTURE

*Professor:* W. G. KAMMLADE.
*Associate Professor:* H. W. BEAN.
*Assistant Professor:* H. READ.

NOTE: Courses listed under the title "Agriculture" are those in the College of Agriculture not assignable to a particular department. They are taught by members of the administrative staff. Associate Dean R. R. Hudelson is responsible for administrative matters pertaining to these courses.

There is no provision for majors or minors under the title "Agriculture." Major and minor programs are assigned to organized departments of the College.

### Courses for Undergraduates

114. **Agricultural Information Methods.** Gathering, organizing, and preparing agricultural and home economics educational information material for weekly and daily newspapers and radio farm and home programs; sources of agricultural and home economics information material; basic principles and practice in preparing such information for press and radio in support of educational programs. I, II; 3. Prerequisite: Sophomore standing. READ and others.

### Courses for Advanced Undergraduates

206. **Agricultural Extension.** For students interested in agricultural extension work. II; 2. KAMMLADE.

215. **Advanced Agricultural Information Methods.** Gathering, organizing, and writing agricultural and home economics educational information material for farm and home magazines and journals; preparing agricultural and home economics information for educational leaflets and bulletins; using visual aids in presenting educational information; coordination of information media. I, II; 3. Prerequisite: Agriculture 114, or consent of instructor. READ and others.

216. **Experimental and Biological Statistics.** A study of statistical methods and their value in agricultural experimentation. Students receiving credit in this course will not receive credit in Agricultural Economics 341. I, II; 3. BEAN.

# AGRONOMY

*Professors:* W. L. Burlison (Head of Department), F. C. Bauer, O. T. Bonnett, R. H. Bray, E. E. DeTurk (Emeritus), G. H. Dungan, J. E. Gieseking, J. C. Hackleman, R. W. Jugenheimer, B. Koehler, A. L. Lang, C. M. Linsley, O. H. Sears, R. S. Smith (Emeritus), E. H. Tyner, D. C. Wimer, C. M. Woodworth.

*Associate Professors:* W. M. Bever, E. B. Earley, L. T. Kurtz, S. W. Melsted, R. T. Odell, R. S. Stauffer, E. D. Walker.

*Assistant Professors:* A. H. Beavers, C. H. Farnham, J. B. Fehrenbacher, J. W. Gerdemann, P. E. Johnson, E. R. Leng (on leave), L. B. Miller, W. F. Purnell, W. O. Scott, H. J. Snider, A. Tate (Emeritus), A. U. Thor, P. T. Veale, H. L. Wascher, R. O. Weibel.

*Associate:* C. J. Badger.

*Instructors:* W. E. Kennedy (on leave), D. L. Lynch, F. W. Slife.

*Assistants:* J. D. Alexander, J. C. Anderson (Emeritus), C. F. Austin, D. K. Banerjee, L. F. Bauman, G. R. Bauwin, H. L. Breland, P. C. Doty, W. R. Fortney, H. W. Gausman, A. F. Grandt, C. Gray, J. H. Griffin, R. D. Hauck, E. G. Knox, J. C. Lyons, R. H. Maier, R. J. Metzger, D. L. Mulvaney, J. C. Neill, J. L. Nelson, W. C. Nelson, W. R. Oschwald, J. W. Pendleton, B. W. Ray, Joan A. Rheumer, W. M. Ross, A. E. Royer, R. H. Rust, D. A. Vinson.

## Courses for Undergraduates

**110. Plant and Animal Genetics.** Same as Animal Science 110, Dairy Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104.

**121. Crop Production.** General introductory course. Production and harvesting of common farm crops; means of improvement; diseases, insects, weeds, and their control; seed purity and germination; market grades of grain. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Botany 100. Dungan, Nelson.

## Courses for Advanced Undergraduates

**200. Special Problems in Agronomy.** Individual problems in crops or soils. I, II; 3 to 5. Prerequisite: Senior standing; approval of head of department. Staff.

**201. Soils.** General introductory course. Origin, formation, and nature of soils; kinds of soils and their properties; conservation and increase of productive capacity; fertilizers, management practices, and cropping systems. I, II; 5. Prerequisite: Chemistry 101 or 102; Geology 105. Tyner, Wimer.

**270. Raw Materials for Processing.** Same as Food Technology 270. Lectures, reference readings, and laboratory work on cereal grains and oilseeds important to the food processing industry. Local field trips to grain and oilseed storage elevators or mills. II; 3. Prerequisite: Botany 100, or equivalent. Dungan.

## Courses for Advanced Undergraduates and Graduates

**301. Genesis, Morphology, Classification, and Geography of Soils.** Factors governing and processes active in soil development; physical and chemical properties of the soil groups of the world; classification and nomenclature of soil; soil geography. Field trips to be arranged; cost not to exceed $16. II; 3 hours, or ½ unit. Prerequisite: Agronomy 201. Beavers.

**302. Role of Microorganisms in Soil Fertility.** Microorganisms of the soils in relation to fertility; nitrogen fixation, assimilation, and preservation. I; 3 hours, or ½ unit. Prerequisite: Agronomy 201. Lynch, Sears.

303. **Soil Productivity, Its Variation, Modification, and Conservation.** Factors affecting soil productivity and its conservation; soil type response; influence of cropping systems, fertilizers, and management practices on productivity trends. II; 3 hours, or ½ unit. Prerequisite: Agronomy 201; senior standing. BAUER.

304. **Metabolism of Soil Microorganisms.** Chemistry and bacteriology of the nitrogen cycle; nitrogen fixation, nitrification, nitrate assimilation, denitrification, and synthesis of nitrogen compounds by microorganisms; relation of nitrogen to other cycles. II; 3 hours, or ½ unit. Prerequisite: Bacteriology 104 or 320; Chemistry 132. LYNCH, SEARS.

305. **Physical Methods for Soil Conservation Studies.** Physical properties of soils affecting conservation, productivity, and drainage; their investigation by field and laboratory methods. Lecture, discussion, and laboratory. I; 3 hours, or ½ unit. Prerequisite: Agronomy 201. Offered in 1951-1952 and in alternate years. STAUFFER.

306. **Fertilizers and Their Soil Reactions.** Fertilizer sources and materials. Chemical forms of elements in the soil, reactions of fertilizers in soils, determination of fertilizer needs, soil test methods, fertilizer application. I; 3 hours, or ½ unit. Prerequisite: Agronomy 201. KURTZ.

307. **Principles of Soil Conservation.** National and local implications of soil conservation and its relation to farming systems, land management, climate, soil character, and farming operations. II; 3 hours, or ½ unit. Prerequisite: Agronomy 121 and 201; senior standing. STAUFFER.

308. **Plant Composition and Chemurgy.** Synthesis, general chemistry, and principal source of carbohydrates, oils, and proteins. Chemical composition of agronomic plants as affected by rate and date of planting and by nutritional, environmental, and genetic factors. Relation of plant composition to utilization. II; 3 hours, or ½ unit. Prerequisite: Chemistry 132, or equivalent; Agronomy 121; Agronomy 201, or consent of instructor.

312. **Farm Appraisals.** Same as Agricultural Economics 312. Valuation of farm real estate: soils, crops, management, buildings, drainage, land titles, prices, and taxes in relation to value. Local field trips; estimated expense, $5. II; 5 hours, or 1 unit. Prerequisite: Agronomy 201 and Agricultural Economics 120, or equivalent. HUDELSON and others.

317. **Plant Pathology.** Same as Botany 317, Horticulture 317, and Plant Pathology 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. LINFORD.

321. **Crop Production as Affected by the Environment.** Response of crop plants to their habitat; study of climatic, physiographic, edaphic, and biotic factors of the environment in relation to crop growth; means by which crop hazards may be reduced. I; 3 hours, or ½ unit. Prerequisite: Agronomy 121. DUNGAN.

322. **Forage Crops and Pastures.** Lectures and discussions of roughage production, forage crop characteristics and ecology, grasslands of farm and range as related to animal production and soil conservation. I, II; 3 hours, or ½ unit. Prerequisite: Agronomy 121. SLIFE.

323. **Improvement of Farm Crops by Breeding.** Heredity and variation in crop plants; effects of self-fertilization and cross-fertilization; principles and results of selection and hybridization in crop improvement. I; 3 hours, or ½ unit. Prerequisite: Agronomy 121. BONNETT.

324. **Principles of Field Plot Experimentation.** Purposes, methods, and principles of field experimentation; interpretation of results. I; 3 hours, or ½ unit. Prerequisite: Senior standing. WOODWORTH.

325. **Corn Breeding.** Principles and procedures involved in developing, testing, and production of inbred lines and hybrids; production and processing of hybrid seed corn; genetics of corn. II; 3 hours, or ½ unit. Prerequisite: Agronomy 323. JUGENHEIMER.

331. **Grain Grading and Marketing.** Same as Agricultural Economics 331 and Marketing 331. Factors affecting the quality of grain crops; standards employed in their

classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

377. **Diseases of Field Crops.** Same as Botany 377 and Plant Pathology 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Agronomy 121 or 317, or consent of instructor. BEVER, GERDEMANN.

379. **Research Methods in Plant Pathology.** Same as Botany 379, Horticulture 379, and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Agronomy 317; senior standing. GERDEMANN, GOTTLIEB, THORNBERRY.

## AIR FORCE SCIENCE

*Professors:* Lieutenant Colonel F. W. DOOLEY (Head of Department).

*Assistant Professors:* Lieutenant Colonel D. W. COX; Captains R. F. ADKINS, W. E. KENNEDY, R. L. MYERS, C. L. ODUM, N. A. ROSSER, E. W. SPITZER, J. R. STARNES, J. W. VAN SICKLE.

*Instructors:* Master Sergeants J. L. EKISS, B. I. FIEDLER, O. D. MAYHUGH, J. S. SMALLWOOD, C. E. TOWERS, M. A. WILSON; Technical Sergeants H. D. CHARLES, R. W. CURTIS; Staff Sergeant M. A. SYMINGTON, JR.

### Courses for Undergraduates

111. **Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, and thirty hours devoted to world political geography, a study of the areas and resources of the various states organized as political units, together with the people who live in these areas. I; 1. Prerequisite: Pronounced physically fit by the University.

112. **Freshman Drill and Theory.** Continuation of Air Force Science 111. Basic military instruction to include leadership, drill and exercise of command, and thirty hours devoted to world political geography. I; 1. Prerequisite: Air Force Science 111, or equivalent as determined by head of department and institution.

113. **Sophomore Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, aerodynamics and propulsion, and meteorology. I; 1. Prerequisite: Air Force Science 112, or equivalent as determined by head of department and institution.

114. **Sophomore Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, navigation, and applied air power. II; 1. Prerequisite: Air Force Science 113, or equivalent as determined by head of department and institution.

### Courses for Advanced Undergraduates

215. **Junior Administration and Logistics.** The development of knowledge and skill in organization, leadership and exercise of command, air operations, transportation, administration and supply. I; 3. Prerequisite: Air Force Science 114, or equivalent as determined by head of department and institution. VAN SICKLE.

216. **Junior Administration and Logistics.** Continuation of Air Force Science 215, with emphasis on Air Force supply. II; 3. Prerequisite: Air Force Science 215, or equivalent as determined by head of department and institution. VAN SICKLE.

217. **Senior Administration and Logistics.** Continuation of Air Force Science 216, to include Air Force management, Air Force teaching method, and military law and

boards. I; 3. Prerequisite: Air Force Science 216, or equivalent as determined by head of department and institution. ADKINS, COX, DOOLEY.

218. **Senior Administration and Logistics.** Continuation of Air Force Science 217, to include career development, food service supervision, inspector general, administration, staff functions, and air comptroller. II; 3. Prerequisite: Air Force Science 217, or equivalent as determined by head of department and institution. COX, DOOLEY.

225. **Junior Aircraft Maintenance and Engineering.** The development of knowledge and skill in organization, leadership and exercise of command, air operation, supply, transportation, aircraft maintenance and engineering. I; 3. Prerequisite: Air Force Science 114, or equivalent as determined by head of department and institution. Only students pursuing a degree in engineering will be eligible. ADKINS, SPITZER, TOWERS.

226. **Junior Aircraft Maintenance and Engineering.** Continuation of Air Force Science 225, to include aircraft maintenance and engineering in such subjects as electricity, propellers, hydraulic and pneumatic systems, structures, and miscellaneous. II; 3. Prerequisite: Air Force Science 225, or equivalent as determined by head of department and institution. ADKINS, SPITZER, TOWERS.

227. **Senior Aircraft Maintenance and Engineering.** Continuation of Air Force Science 226, to include Air Force management, Air Force teaching methods and administration. I; 3. Prerequisite: Air Force 226, or equivalent as determined by head of department and institution. ADKINS, SPITZER, TOWERS.

228. **Senior Aircraft Maintenance and Engineering.** Continuation of Air Force Science 227, to include inspector general, career development, Air Force supply, and aircraft maintenance subjects such as organizational and field maintenance, aircraft engine operation and conditioning, cruise control, air inspector and test flights. II; 3. Prerequisite: Air Force Science 227, or equivalent as determined by head of department and institution. ADKINS, DOOLEY, SPITZER, TOWERS.

231. **Junior Flight Operations.** This course is designed to provide instruction which will facilitate and materially augment the academic phases of training in the Flying Schools of the Air Training Command. The first thirty hours of instruction will be devoted to the major commands to include the mission, organization, types of equipment and method of operation of each. The remaining sixty hours will be devoted to instruction in principles of flight, aircraft engineering, and introduction to instruments, air navigation, meteorology, and new developments. I; 3. Prerequisite: Air Force Science 114, or equivalent as determined by head of department and institution.

235. **Junior General Technical.** This course is designed to point out the primary technical fields and the related equipment used in the United States Air Force, and how certain specialists contribute to the accomplishment of the assigned mission. The following courses are included: problem solving and writing, familiarization and use of technical publications, organization and mission of the United States Air Force, the wing air base, technical careers in the USAF, atomic theory and radiological defense, new developments. I; 3. Prerequisite: Air Force Science 114, or equivalent as determined by head of department and institution.

## ANIMAL SCIENCE

### (Including Animal Nutrition)

*Professors:* L. E. CARD (Head of Department), R. C. ASHBY (Emeritus), S. BULL, W. E. CARROLL, J. L. EDMONDS, H. S. GRINDLEY (Emeritus), T. S. HAMILTON, W. G. KAMMLADE, H. H. MITCHELL, E. ROBERTS, H. P. RUSK, H. G. RUSSELL, H. M. SCOTT, R. R. SNAPP.

*Associate Professors:* H. W. BEAN, R. M. FORBES, B. C. JOHNSON, A. V. NALBANDOV, A. L. NEUMANN.

*Assistant Professors:* D. E. BECKER, G. R. CARLISLE, C. W. CRAWFORD, U. S. GARRIGUS, MARIAN F. JAMES, R. F. NYSTROM, S. F. RIDLEN, S. W. TERRILL.

*Instructors:* R. C. Eaton, Marjorie Edman, W. H. Hale.

*Assistants:* C. R. Adams, D. M. Baird, K. D. Barbee, K. W. Barbee, M. H. Bert, J. W. A. Brant, M. Broadbent, Eva M. Cohn, J. E. Corbin, Lucile Dekker-van Ghyl, Uva G. Frey, E. A. Goffi, W. T. Haines, E. W. Hartsook, R. Hollandbeck, L. H. Horn, Jr., H. M. Hickman, K. W. Keane, Margaret B. Keane, Mary H. Keith (Emerita), J. D. Kemp, P. Kivalo, F. P. Kwan, Pei-Hsing Lin, Yen H. Loo, R. J. Meade, W. W. Moore, Janet L. Page, M. W. Pasvogel, C. V. Ross, H. V. Shirley, Jr., J. T. Sime, D. A. Vaughan, R. C. Wahlstrom, J. A. Welch, R. F. Wheeler.

## ANIMAL SCIENCE

### Courses for Undergraduates

**101. Introduction to Animal Science.** Elementary livestock judging. Required of all students in the curriculum in general agriculture. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Crawford and others.

**102. Principles of Feeding.** Composition of feeds and of animal products; manurial value of feeds; how the animal utilizes feed; balancing rations. I, II; 3. Prerequisite: Chemistry 101 or 102. Bull and others.

**103. Breeds and Market Classes of Livestock.** Principles of selecting and judging market and breeding classes of beef cattle, horses, sheep, and swine. Characteristics and history of major breeds of livestock. Lectures, demonstrations, and practice judging. I; 5. Prerequisite: Animal Science 101, or equivalent, or junior standing. Snapp and others.

**104. Selection and Use of Meat.** Physical and chemical composition; nutritive value; selection and utilization of cuts. Lectures and demonstrations. I; 2. Bull.

**110. Plant and Animal Genetics.** Same as Agronomy 110, Dairy Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104.

### Courses for Advanced Undergraduates

**201. Livestock Management.** The development and importance of the livestock industry. The economic advantages of the various classes of farm animals and their relation to farm management. Selection and systems of breeding as used by successful breeders. Special lectures and demonstrations of caretakers' skills. II; 3. Prerequisite: Animal Science 102. Edmonds.

**202. History of Breeds of Livestock.** In addition to lectures, discussions, and assigned reading dealing with the historical development of the various breeds, some judging practice will be used to illustrate different breed types. It is recommended that this course precede Animal Science 203. II; 3. Prerequisite: Animal Science 103. Neumann.

**203. Advanced Livestock Judging.** The team to represent the University in the Annual Intercollegiate Student Judging Contest will be chosen from the students in this class. I; 3. Prerequisite: Animal Science 103; Animal Science 202 is recommended. Neumann and others.

**204. Farm Meats.** Slaughter, grading, cutting, and processing of meats. An inspection trip will be made to the Chicago Stock Yards and packing plants; estimated expense, $15. II; 3. Prerequisite: Animal Science 104. Wheeler.

**205. Meat Judging and Grading.** The team to represent the University in the Annual Intercollegiate Student Judging Contest will be chosen from the students in this class. I; 2. Prerequisite: Animal Science 104 or 204. Kemp.

**206. Light and Heavy Horses.** Breeds, management, judging. II; 3. Prerequisite: Animal Science 102, or junior standing. Crawford, Edmonds.

207. **Selection, Judging, and Grading of Poultry and Poultry Products.** Selection of breeding stock on the basis of egg production and breed characteristics; commercial grading and inspection of market eggs and poultry. The team to represent the University in the Annual Intercollegiate Student Poultry Judging Contest will be chosen from the students taking or having had this course. I; 3. Prerequisite: Animal Science 304. Offered in 1952-1953 and in alternate years. EATON.

209. **Special Problems.** I, II; 3 to 5. Prerequisite: Senior standing; approval of head of department. BULL, CARD, EDMONDS, FORBES, GARRIGUS, HAMILTON, NALBANDOV, ROBERTS, SCOTT, SNAPP, TERRILL.

### Courses for Advanced Undergraduates and Graduates

301. **Beef Production.** The principles of feeding and management of beef cattle; financial aspects of beef production; diseases and parasites of beef cattle; fitting cattle for show and sale. Lectures and discussions. I, II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. SNAPP.

302. **Sheep Production.** The sheep and wool industries; principles and practices of various phases of production. II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. GARRIGUS, HALE.

303. **Pork Production.** The place of the swine enterprise on the farm; selecting, breeding, feeding, managing, and marketing of swine for greatest profit. I, II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. TERRILL.

304. **Poultry Management.** Poultry science and practice with special reference to the place of the poultry enterprise on Illinois farms. Students may register for 3 hours credit without laboratory or for 4 hours credit with laboratory. I, II; 3 or 4 hours, or ½ unit. Prerequisite: Animal Science 102. SCOTT.

305. **Animal Genetics.** The principles of heredity and their application to the problems of breeding. II; 3 hours, or ½ unit. Prerequisite: Zoology 104, or equivalent. ROBERTS.

## ANIMAL NUTRITION

### Courses for Advanced Undergraduates and Graduates

301. **Introduction to Animal Nutrition.** For students whose major is not animal nutrition, but who desire an introduction to the principles and practical applications of the science to animal feeding. II; 3 hours, or ½ unit. Prerequisite: Animal Science 102; Chemistry 132. FORBES.

## ANTHROPOLOGY

(See Sociology and Anthropology)

# ARCHITECTURE

*Professors:* T. C. BANNISTER (Head of Department), C. C. BRIGGS, O. S. FJELDE, G. GUEVREKIAN, W. S. KINNE, JR., A. K. LAING, J. T. LENDRUM, V. G. LE-RICOLAIS (Visiting), F. M. LESCHER (Emeritus), E. LOVE, N. D. MORGAN, R. NEWCOMB, C. E. PALMER, L. H. PROVINE (Emeritus), W. H. SCHEICK (on leave of absence).

*Associate Professors:* R. A. JONES, G. S. KEITH, D. B. LINDSAY, T. E. O'DONNELL (Emeritus), E. F. TOTH, A. R. WILLIAMS, J. W. WOOD.

*Assistant Professors:* J. S. BAKER, J. M. BARROW, G. T. CLAYTON, E. M. FARNHAM, W. M. JOHNSON, JR., R. M. LINE, R. P. LINK, F. D. MILES, J. A. PRESTRIDGE, JR., R. J. SMITH.

*Instructors:* B. D. Brinkworth, H. C. Edwards, C. B. Looker, Jr., J. R. McGhee (on leave), W. Stoutenburg, Jr., E. Elizabeth Trainer, J. B. Wallace.

*Visiting Critics:* Ernest A. Grunsfeld, Jr., A. F. Heino, Maurice W. Kley.

*Research Associate:* J. G. Replinger.

*Assistants:* L. O. Adkins, Jr., F. R. Bates, D. Benedict, S. B. Berry, S. Blum, F. Caliendo, A. Cangiamila, H. K. Corrie, S. B. Denton, F. E. Dushin, S. G. Fishman, S. G. Footlik, G. M. Havlik, E. D. Hernandez, E. H. Matthei, M. M. Meyer, E. O. Moore, Jr., K. C. Naslund, R. E. Nevara, D. K. Pyle, R. L. Ritz, J. A. Scheeler, J. E. Severns, E. R. Seymour, R. M. Simms, L. C. Smith, Jr., C. R. Wagner, G. C. Winterowd, J. D. Woods, W. J. Worth, H. C. Young.

## Courses for Undergraduates

**101. Introduction to Architecture.** An introduction to the building industry and the profession of architecture; exercises illustrating basic architectural forms and their organization. I, II; 3. Fjelde and others.

**113. History of Ancient Architecture.** A description and analysis of the development of the architecture of the ancient East, Greece, and Rome, related to the environmental and cultural setting. I, II; 2. Prerequisite: Architecture 131, or sophomore standing. Edwards.

**131. Architectural Design.** Beginning study of architectural planning and designing. Fundamentals of sketching and presentation. I, II; 3. Prerequisite: Registration in General Engineering Drawing 107. Fjelde, Line, and others.

**132. Architectural Design.** Continuation of the fundamentals of architectural design. I, II; 3. Prerequisite: Architecture 131, or consent of instructor. Fjelde and others.

**133. Architectural Design.** Continued study of architectural planning and designing; principles of plan, elevation, and section in small buildings. I, II; 3. Prerequisite: Architecture 132. Barrow, Miles, Trainer, and others.

**134. Architectural Design.** Continuation of Architecture 133. I, II; 3. Prerequisite: Architecture 133. Barrow, Miles, Trainer, and others.

**141. Materials and Methods of Construction I.** Wood frame construction as used in houses; manufacture and performance characteristics of materials; framing systems; typical details; finishing materials. I, II; 2. Prerequisite: Registration in Architecture 131. Clayton, Kinne, and others.

**142. Materials and Methods of Construction II.** Non-fire resistance construction; manufacture and performance characteristics of materials; support systems; typical details; finishing materials. I, II; 2. Prerequisite: Architecture 141. Clayton, Kinne, and others.

**143. Materials and Methods of Construction III.** Fire resistant construction; manufacture and performance characteristics of materials; support systems; typical details; finishing materials. I, II; 2. Prerequisite: Architecture 142. Clayton, Kinne, and others.

**144. Materials and Methods of Construction IV.** Modular dimensioning; prefabrication; thermal and sound insulation; industrial structures; wide span systems; architectural acoustics. I, II; 2. Prerequisite: Architecture 143. Clayton, Kinne, and others.

**171. Elements of Drawing and Design.** Architectural elements, rendering, shades and shadows, perspective, and composition. Not open to students working toward a degree in architecture. I, II; 3. Brinkworth, Johnson, McGhee, Wallace.

**172. Elements of Drawing and Design.** Continuation of work in Architecture 171 with additional media. Not open to students working toward a degree in architecture. I, II; 3. Prerequisite: Architecture 171. Brinkworth, Johnson, McGhee, Wallace.

**175. Frame Construction Details.** Primarily for students in landscape architecture. Not open to students working toward a degree in architecture. I; 2. Prerequisite: Consent of instructor. Clayton.

176. **Masonry Construction Details.** Primarily for students in landscape architecture. Not open to students working toward a degree in architecture. II; 2. Prerequisite: Architecture 175, or consent of instructor. CLAYTON.

## Courses for Advanced Undergraduates

214. **History of Medieval Architecture.** A description and analysis of the development of medieval architecture in Europe and the East related to the environmental and cultural setting. I, II; 3. Prerequisite: Architecture 113, or consent of instructor. LAING.

215. **History of Renaissance and Baroque Architecture.** A description and analysis of the development of Renaissance and Baroque architecture related to the environmental and cultural setting. I, II; 3. Prerequisite: Architecture 214, or consent of instructor. EDWARDS.

216. **Modern Architecture.** A description and analysis of the development of architecture in Europe and America from 1790 to the present day, related to the environmental and cultural setting, and especially the impact of science and technology. I, II; 3. Prerequisite: Architecture 215, or consent of instructor. To be offered beginning 1952-1953. LAING.

217. **Architecture and Civilization of the Americas to 1870.** I, II; 2. Prerequisite: Architecture 216. EDWARDS.

218. **Architecture and Civilization of the Americas and Europe Since 1870.** I, II; 2. Prerequisite: Architecture 217. BANNISTER.

235. **Architectural Design.** Principles of site planning, group planning, and studies of other contemporary architectural problems. I, II; 5. Prerequisite: Architecture 134. BAKER, FARNHAM, LOOKER, PRESTRIDGE, SMITH, STOUTENBURG.

236. **Architectural Design.** Principles of site planning, group planning, and studies of other contemporary architectural problems. I, II; 5. Prerequisite: Architecture 235. BAKER, FARNHAM, LOOKER, PRESTRIDGE, SMITH, STOUTENBURG.

244. **Working Drawings.** The preparation of working drawings for the construction of buildings; outline specifications; cost estimates. I, II; 2. Prerequisite: Architecture 144. CLAYTON, KINNE, and others.

245. **Structural Elements.** Graphical and algebraic analysis of forces; centroids; moments of inertia; bending moments, shear, and deflection in beam design; truss loadings and stresses, kerns, pressures, shear, and moments in masonry structure. Use of handbooks. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150 or 171. LINK and others.

246. **Theory of Structural Design.** Analysis and design of timber trusses, riveted steel trusses, welded steel trusses, timber floor panels, steel floor panels, columns, plate girders, trussed beams, and application problems from actual professional practice. Use of handbooks. I, II; 3. Prerequisite: Architecture 245. TOTH and others.

247. **Structural Planning.** General problems in the selection and design of structural systems for buildings; methods of analysis; site exploration; foundations; bracing; special systems. I, II; 3. Prerequisite: Architecture 246. To be offered beginning 1953-1954.

255. **Building Sanitation.** Water supply and treatment; drainage systems, sewage disposal, plumbing fixtures and their installation. I, II; 1. Prerequisite: Junior standing in architecture. CLAYTON.

256. **Building Sanitation.** Water supply and treatment; purification, pumping, and storage; piping and drainage systems; plumbing fixtures and their installation; plumbing design for special problems. I, II; 2. Prerequisite: Junior standing in architecture. CLAYTON.

257. **Reinforced Concrete Theory.** Principles of reinforced concrete construction; theory of design of structural elements. I, II; 3. Prerequisite: Architecture 246; senior standing in architecture. PALMER.

265. **Theory of Architecture.** The principles of planning and composition in architectural design. I, II; 2. Prerequisite: Architecture 134. BAKER, FARNHAM, PRESTRIDGE, SMITH, STOUTENBURG, WOOD.

**266. Study of Modern Planning Problems.** Lectures and discussions. I, II; 1. Prerequisite: Registration in Architecture 236. BAKER, FARNHAM, PRESTRIDGE, SMITH, STOUTENBURG, WOOD.

**268. Specifications.** Lectures and discussions of specifications for buildings; supplementary and general conditions of the contract; detailed specifications; supervision and superintendence; building laws and codes. I, II; 3. Prerequisite: Senior standing in architecture. KINNE.

**283. Architectural Practice.** Discussion of professional ethics and problems confronting the architect in the conduct of his business; procedure and control of work in the office and in the field; methods of making architectural estimates; contracts and contract documents; awarding of contracts. I, II; 2. Prerequisite: Senior standing in architecture. KINNE.

## Courses for Advanced Undergraduates and Graduates

**337. Architectural Design.** Advanced problems in modern buildings and building groups with more complex requirements. I, II; 7 hours, or 1½ units. Prerequisite: Architecture 236; senior standing in architecture. GUEVREKIAN, KEITH, LINDSAY, LOVE, WILLIAMS, WOOD.

**338. Architectural Design.** Advanced problems in modern buildings and building groups with complex requirements. I, II; 7 hours, or 1½ units. Prerequisite: Architecture 337; senior standing in architecture. GRUNSFELD, GUEVREKIAN, KEITH, LINDSAY, LOVE, WILLIAMS, WOOD.

**347. Theory of Structures.** Analysis of framework; industrial buildings; churches; arches; deflections; the elastic theory. I, II; 5 hours, or 1 unit. Prerequisite: Architecture 246; Theoretical and Applied Mechanics 221; credit or registration in Architecture 257. LINK.

**348. Advanced Structures.** Theaters, assembly halls, and high buildings; continuous beams and trusses; rigid frames; statically indeterminate structures. I, II; 5 hours, or 1 unit. Prerequisite: Architecture 347; credit or registration in Architecture 358. MORGAN.

**358. Reinforced Concrete Design.** Reinforced concrete building design; analysis of various types of modern fireproof construction. I, II; 3 hours, or ½ unit. Prerequisite: Architecture 257; credit or registration in Architecture 348. MORGAN.

# ART

*Professors:* A. S. WELLER (Head of Department), L. BAILEY, C. E. BRADBURY, C. V. DONOVAN, F. J. ROOS, J. R. SHIPLEY.

*Associate Professors:* C. A. DIETEMANN, W. F. DOOLITTLE, J. D. HOGAN, J. W. KENNEDY, H. A. SCHULTZ, LOUISE M. WOODROOFE.

*Assistant Professors:* N. BRITSKY, L. R. CHESNEY, R. L. DRUMMOND, R. E. HULT, M. B. MARTIN, A. J. PULOS, E. C. RAE, J. W. RAUSHENBERGER, N. V. ZIROLI.

*Instructors:* E. H. BETTS, E. J. BRANSBY, C. W. BRIGGS, MARIAN BEVERIDGE, R. E. ECKERSTROM, G. N. FOSTER, J. H. LYNCH, R. PERLMAN, M. A. SPRAGUE, BACIA R. STEPNER, L. W. WILLIAMS, L. ZAMISKA.

*Assistants:* W. C. COLLINS, R. J. DUDLEY, G. EHRLICH, R. A. GINSTROM, A. J. KAYTOR, K. D. KITTS, R. A. LEADER, S. SCHULTZ, J. E. SCHWARZ, R. F. SMITH.

## Courses for Undergraduates

**101. Water Color.** Still life and outdoor sketching. I, II; 2. Prerequisite: Art 122. KENNEDY.

**102. Water Color.** Still life and outdoor sketching. I, II; 2. Prerequisite: Art 101. KENNEDY.

**104. Interior Design.** I or II; 2. Prerequisite: Art 131 or 133, or registration in Art 186. SCHULTZ.

105. **Introduction to Water Color Painting.** Elementary water color sketching from landscape. Not open to students majoring in art. S; 2. DOOLITTLE.

106. **Introduction to Oil Painting.** Elementary oil painting and sketching from still life and landscape. Not open to students majoring in art. S; 2. KENNEDY.

107. **Elementary Drawing.** Practical problems in elementary drawing as applied to solids, line drawing, light and shade, outdoor and studio sketching. Not open to students majoring in art. S; 1. BRIGGS.

108. **Introduction to Advertising Design.** Practical methods of lettering and layout. Primarily for public school teachers and students in commerce and journalism. Not open to students majoring in art. S; 2. PERLMAN.

109. **Introduction to Three-Dimensional Design.** Experimental problems in space, motion, and materials. Not open to students majoring in art. S; 2. PULOS.

110. **Elementary Design.** Exercises in elementary design with emphasis on the practical application of the principles of design. Not open to students majoring in art. S; 1. FOSTER.

111. **Introduction to Ancient and Medieval Art.** Cultural analysis of the interrelated fields of architecture, sculpture, painting, and other humanistic studies previous to the Italian Renaissance. I; 3. Prerequisite: Sophomore standing. RAE.

112. **Introduction to Renaissance and Modern Art.** Cultural analysis of the interrelated fields of architecture, sculpture, painting, and other humanistic studies beginning with the Italian Renaissance and continuing through the modern period. II; 3. Prerequisite: Sophomore standing. RAE.

115. **Art Appreciation.** An introduction to the factors inherent in architecture, sculpture, painting, and other arts. Primarily for non-art students. I, II; 3. Prerequisite: Sophomore standing. ROOS, WILLIAMS.

121. **Art Form.** Structure of graphic expression; drawing from cast and still life; design; clay modeling; action sketch from model. Lectures and demonstrations on various phases of art. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. BRIGGS, BRITSKY, DIETEMANN, FOSTER, MARTIN, RAUSHENBERGER, ZAMISKA.

122. **Art Form.** Structure of graphic expression; drawing from cast and still life; design; clay modeling; action sketch from model. Lectures and demonstrations on various phases of art. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Art 121. BRIGGS, BRITSKY, FOSTER, MARTIN, RAUSHENBERGER, S. SCHULTZ, SPRAGUE, ZAMISKA.

123. **Life Drawing and Anatomy.** Construction of the figure in charcoal; study of the head from life; figure sketching; and lectures on anatomy. I, II; 5. Prerequisite: Art 122. BAILEY, BRADBURY, BRIGGS, CHESNEY, HULT, SPRAGUE.

124. **Life Drawing and Anatomy.** Construction of the figure in charcoal; study of the head from life; figure sketching; and lectures on anatomy. I, II; 5. Prerequisite: Art 123. BAILEY, BRADBURY, BRIGGS, CHESNEY, HULT, SPRAGUE.

125. **Life Drawing.** I, II; 2. Prerequisite: Art 122. BAILEY.

126. **Life Drawing.** I, II; 2. Prerequisite: Art 125. BAILEY.

131. **Elementary Composition.** Pictorial composition in line, pattern, and color. I, II; 2. Prerequisite: Sophomore standing in art. FOSTER, ZIROLI.

132. **Elementary Composition.** Pictorial composition in line, pattern, and color. I, II; 2. Prerequisite: Sophomore standing; Art 131. FOSTER, ZIROLI.

133. **Design Workshop.** Fundamentals of three-dimensional design. Primarily for students in the industrial design curriculum. I, II; 2. Prerequisite: Art 122. PULOS.

134. **Design Workshop.** Fundamentals of three-dimensional design. Primarily for students in the industrial design curriculum. I, II; 2. Prerequisite: Art 133. PULOS.

137. **Design Analysis.** Furniture, interior architecture, industrial products and other art forms critically evaluated in terms of function, structure, material, esthetic quality, and appropriateness; procedure and methods of design. Primarily for students in engineering and industrial education. I; 2. Prerequisite: Sophomore standing or consent of instructor. SHIPLEY.

141. **Still Life.** Painting in oil from arranged groups. I, II; 2. Prerequisite: Art 122. HOGAN, KENNEDY, ZIROLI.

142. **Still Life.** Painting in oil from arranged groups. I, II; 2. Prerequisite: Art 141. HOGAN, KENNEDY, ZIROLI.

150. **Modeling.** Anatomical and ornamental forms. Open to students in other colleges. I, II; 2. Prerequisite: Consent of instructor. EHRLICH, MARTIN.

151. **Sculpture.** Anatomical and ornamental forms; plaster molds and models; wood and stone sculpture. I, II; 2. Prerequisite: Art 122. MARTIN.

152. **Sculpture.** Anatomical and ornamental forms; plaster molds and models; wood and stone sculpture. I, II; 2. Prerequisite: Art 151. MARTIN.

170. **Recreational Crafts.** Introduction to design and execution in crafts particularly adapted to work with children in schools, playgrounds, and summer camps. Primarily for recreation majors in physical education for men. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. BEVERIDGE, GINSTROM, STEPNER.

171. **Metalwork and Jewelry I.** A course in the design and execution of simple jewelry, flatware, and holloware, including study of the characteristics of base and precious metals and stones and working experience in the basic forming, decorating, joining, and finishing processes. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. PULOS.

172. **Metalwork and Jewelry II.** Advanced work in the design and production of jewelry, flatware, and holloware with emphasis on the development of related or more complicated pieces. Manipulative techniques are expanded and experimentation with materials and processes is encouraged. I, II; 2. Prerequisite: Art 171. PULOS.

173. **Pottery I.** A course in the design and production of pottery by hand methods. Work will cover the basic processes of forming, decorating, and firing. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

174. **Pottery II.** A course in advanced work in studio pottery, including expanded experience in forming methods and glaze compounding. I, II; 2. Prerequisite: Art 173. STEPNER.

175. **Leatherwork I.** A course in the design and execution of simple projects in leather. Characteristics of leather and their uses will be studied as well as forming, decorating, and finishing processes. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

176. **Leatherwork II.** Advanced work in the design and production of leather projects. Work will be concentrated on larger and more complicated work. I, II; 2. Prerequisite: Art 175. STEPNER.

177. **Bookbinding I.** A course in the design and execution of simple projects in portfolio, bookbinding, printing, and stenciling. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

178. **Bookbinding II.** Advanced work in bookbinding. Projects in decorating and finishing. I, II; 2. Prerequisite: Art 177. STEPNER.

181. **Freehand Drawing.** Simple groups of block form, still life, and casts in pencil and charcoal. Primarily for students in architecture and landscape architecture. I, II; 2. LYNCH and others.

182. **Freehand Drawing.** Simple groups of block forms, still life, and casts in pencil and charcoal. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 181. BETTS, LYNCH, and others.

183. **Freehand Drawing.** Charcoal drawing from the cast; water color. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 182. BETTS and others.

184. **Freehand Drawing.** Charcoal drawing from the cast; water color. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 183. BRANSBY, HULT, SPRAGUE.

185. **Design.** Composition in line, pattern, monochrome, and color. For home economics students. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. DRUMMOND and others.

186. **Design.** Composition in line, pattern, monochrome, and color. For home economics students. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Art 185. DRUMMOND and others.

188. **Introduction to Art Form.** I, II; 2. LEADER.

189. **Introduction to Art Form.** I, II; 2. Prerequisite: Art 188. LEADER.

## Courses for Advanced Undergraduates

201. **Water Color.** I, II; 2. Prerequisite: Art 102. KENNEDY.

202. **Water Color.** I, II; 2. Prerequisite: Art 201. KENNEDY.

203. **Art Education Laboratory.** Art in the elementary school. Creative activities in a variety of art materials appropriate for use in the first eight grades of the public school. Class discussion on teaching techniques. Notebook required. I, II; 2. Prerequisite: Art 132, or junior standing. DRUMMOND, H. SCHULTZ.

204. **Art Education Laboratory.** Art in the secondary school. Creative activities in a variety of art materials appropriate for use in the high school. Class discussion on teaching techniques. Notebook required. II; 2. Prerequisite: Art 132, or junior standing. H. SCHULTZ.

211. **History of Art in Industry.** Analysis of applied art in crafts; industrial procedure from early antiquity to the present. Inspection trip required. II; 2. SHIPLEY.

221. **Life Drawing and Portrait.** Drawing from figure in full scale; quick action poses and techniques of sketching in various media; painting from the head. I, II; 5. Prerequisite: Art 124. BRADBURY, HOGAN.

222. **Life Drawing and Portrait.** Monochrome painting from figure in full scale; quick action poses and techniques of sketching in various media; painting from the head. I, II; 5. Prerequisite: Art 221. BRADBURY, HOGAN.

223. **Figure Drawing and Sketch.** Primarily for students in the advertising design curriculum. I, II; 3. Prerequisite: Art 124 KENNEDY.

224. **Figure Drawing and Sketch.** Primarily for students in the advertising design curriculum. I, II; 3. Prerequisite: Art 223. KENNEDY.

231. **Intermediate Composition.** I, II; 3. Prerequisite: Art 132. WOODROOFE.

232. **Intermediate Composition.** I, II; 3. Prerequisite: Art 231. WOODROOFE.

233. **Advanced Composition.** I, II; 4. Prerequisite: Art 232. DOOLITTLE.

234. **Advanced Composition.** I, II; 4. Prerequisite: Art 233. DOOLITTLE.

235. **Illustration.** Problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 132. DIETEMANN.

236. **Illustration.** Problems in the design and execution of book and magazine illustration. I, II; Prerequisite: Art 235. DIETEMANN.

237. **Advanced Illustration.** Advanced problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 236. DIETEMANN.

238. **Advanced Illustration.** Advanced problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 237. DIETEMANN.

241. **Life Painting.** Work from posed model in natural scale. I, II; 4. Prerequisite: Art 222. BRADBURY, HOGAN.

242. **Life Painting.** Work from posed model in natural scale. I, II; 4. Prerequisite: Art 241. BRADBURY, HOGAN.

251. **Advanced Sculpture.** I, II; 2. Prerequisite: Art 152. MARTIN.

252. **Advanced Sculpture.** I, II; 2. Prerequisite: Art 251. MARTIN.

255. **Graphic Arts.** A laboratory course in etching, lithography, and other graphic media. Work will include the complete development of each medium, from sketch to printing stages. I, II; 2. Prerequisite: Junior standing in art or consent of instructor. CHESNEY.

256. **Graphic Arts.** A laboratory course in etching, lithography, and other graphic media. Work will include the complete development of each medium, from sketch to printing stages. I, II; 2. Prerequisite: Art 255. CHESNEY.

261. **Layout and Lettering.** Application of design, lettering, and layout for industrial purposes. I, II; 3. Prerequisite: Junior standing in art. PERLMAN, ZAMISKA.

262. **Layout and Lettering.** Application of design, lettering, and layout for industrial purposes. I, II; 3. Prerequisite: Art 261. PERLMAN, ZAMISKA.

265. **Advertising Design.** Methods of drawing and painting for commercial purposes. I, II; 3. Prerequisite: Junior standing in art. PERLMAN.

266. **Advertising Design.** Methods of drawing and painting for commercial purposes. I, II; 3. Prerequisite: Art 265. PERLMAN.

267. **Advanced Advertising Design.** I, II; 5. Prerequisite: Art 266. DONOVAN.

268. **Advanced Advertising Design.** I, II; 5. Prerequisite: Art 267. DONOVAN.

271. **Materials and Processes.** Use and manipulation of basic materials in modern industry. I, II; 2. Prerequisite: Junior standing in art. PULOS.

272. **Materials and Processes.** Use and manipulation of basic materials in modern industry. I, II; 2. Prerequisite: Art 271. PULOS.

275. **Industrial Design.** Designing of objects for manufacture by the machine industries. I, II; 3. Prerequisite: Junior standing in art. ECKERSTROM, SHIPLEY.

276. **Industrial Design.** Designing of objects for manufacture by the machine industries. I, II; 3. Prerequisite: Art 275. ECKERSTROM, SHIPLEY.

277. **Advanced Industrial Design.** I, II; 5. Prerequisite: Art 276. SHIPLEY.

278. **Advanced Industrial Design.** I, II; 5. Prerequisite: Art 277. SHIPLEY.

281. **Freehand Drawing.** Arrangement of form and color; rhythm and sequence, harmony, and contrast; charcoal, pen, pencil, and water color drawing from cast and still life; outdoor sketching. Primarily for students in architecture. I, II; 2. Prerequisite: Art 184. BRITSKY, SPRAGUE, WOODROOFE.

282. **Freehand Drawing.** Arrangement of form and color; rhythm and sequence, harmony, and contrast; charcoal, pen, pencil, and water color drawing from cast and still life; outdoor sketching. Primarily for students in architecture. I, II; 2. Prerequisite: Art 281. BRITSKY, SPRAGUE, WOODROOFE.

283. **Freehand Drawing.** Figure drawing from cast and life. Primarily for students in architecture. I, II; 2. Prerequisite: Art 282. BRITSKY, LYNCH.

284. **Freehand Drawing.** Figure drawing from cast and life. Primarily for students in architecture. I, II; 2. Prerequisite: Art 283. BAILEY, LYNCH.

### Courses for Advanced Undergraduates and Graduates

311. **Classical Art.** Architecture, painting, sculpture, and minor arts of the Greek and Roman periods. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1952-1953 and in alternate years. RAE.

312. **Medieval Art.** Architecture, painting, sculpture, and minor arts of the Romanesque and Gothic periods. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. RAE.

313. **Italian Renaissance Art.** Architecture, painting, sculpture, and minor arts of Italy during the Renaissance. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. WELLER.

314. **Northern Renaissance Art.** Architecture, painting, sculpture, and minor arts of France, Germany, Spain, and England in the sixteenth, seventeenth, and eighteenth centuries. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. WELLER.

315. **Art of the Nineteenth Century.** Architecture, painting, sculpture, and minor arts of France, Germany, Spain, and England in the nineteenth century. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. ROOS.

316. **Art of the Twentieth Century.** Architecture, painting, sculpture, and minor arts of France, Germany, Spain, and England in the twentieth century. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. ROOS.

317. **American Art.** Architecture, painting, sculpture, and minor arts of the colonies and the United States. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. WILLIAMS.

318. **Latin American Art.** A study of the more important phases and periods of the visual arts of Latin America. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. RAE.

## ASTRONOMY

*Professor:* R. H. BAKER (Head of Department).
*Assistant:* D. S. HEESCHEN.

### Courses for Advanced Undergraduates

201. **Descriptive Astronomy.** The solar system. I, II; 3. Prerequisite: Junior standing. BAKER.

202. **Descriptive Astronomy.** The stars. I, II; 3. Prerequisite: Junior standing. BAKER.

### Courses for Advanced Undergraduates and Graduates

307. **Celestial Mechanics.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 142. BAKER.

314. **Observational Astronomy.** Special problems. S; 2 or 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor. BAKER.

# AVIATION

*Professor:* L. A. BRYAN (Director of Institute of Aviation).

*Instructors:* L. B. APPLEGATE, K. ARON, R. L. AYERS, E. J. BRUNNER, E. A. CUSHMAN, R. W. JOHNSON, G. A. MOSELEY, L. P. NELSON, W. A. NICKELS, BERNICE SCHRADER, J. W. STONECIPHER, C. H. TINSLEY.

*Assistants:* J. LOREENA IVENS, P. A. OTTERSON.

## Courses for Undergraduates

NOTE: Aviation 102 and 103, or 103 and 104 may be taken concurrently.

101. **Private Pilot Course.** Prepares the beginning flight student for a Civil Aeronautics Administration Private Pilot rating. Airplane utility is emphasized throughout the course which includes forty-eight hours of preflight (ground school) study and thirty-six hours of flight training in various models of airplanes. Prerequisite: Consent of Director of Institute. JOHNSON, STONECIPHER, and others.

102. **Secondary Flight Training.** Continuation of the training of the private pilot. The purpose is to develop further the qualities of a good pilot. Aerobatics are emphasized and additional ground training in meteorology and engines is presented. Forty-eight classroom hours of preflight (ground school) study and forty-four hours of flight training (sixteen hours dual and twenty-eight hours solo) in side-by-side monoplane and tandem biplane. I, II; 3. Prerequisite: Aviation 101, or possession of Private Pilot rating; consent of Director of Institute. JOHNSON and others.

103. **Intermediate Flight Training.** The third stage of flight training in preparation for a Commercial Pilot rating. Aerial navigation, cross-country and night flying are emphasized. This course also includes training in radio and use of the E-6B computer. Forty-eight classroom hours of preflight (ground school) study and forty-four hours of flight training (fourteen hours dual and thirty hours solo) in radio-equipped aircraft. I, II; 3. Prerequisite: Aviation 101, or possession of Private Pilot rating; consent of Director of Institute. JOHNSON and others.

104. **Advanced Flight Training.** The final phase of flight training in preparation for a Commercial Pilot rating. Emphasis during this stage is placed on precision flying and the student is prepared for written and flight phases of the examination for a Commercial Pilot rating. Forty-eight classroom hours of work on aircraft, Civil Air Regulations, and general review with forty-four hours of flight training (fourteen dual and thirty solo) in two-place tandem aircraft. I, II; 3. Prerequisite: Aviation 103; consent of Director of Institute. JOHNSON and others.

150. **Aircraft Engine Overhaul.** Engine removal; detailed procedure and practice in complete disassembly of engines; cleaning, inspecting, reworking, or replacing parts. Reassembly, installation in aircraft, and testing. II; 5. Prerequisite: Must have completed the first semester of the aircraft maintenance curriculum, or equivalent. MOSELEY, NELSON.

151. **Applied Aircraft Physics.** Matter and measurements; liquid pressure; atmosphere and air pressure; theory of moments; laws of motion; heat and expansion; work, power, energy, and magnetic effects of electrical currents as they apply to aircraft. I; 3. CUSHMAN.

152. **Aircraft Engine Accessory Overhaul.** The disassembly of aircraft starters, generators, carburetors, magnetos, fuel pumps, and oil pumps. Cleaning, inspecting, repairing, and testing. II; 5. Prerequisite: Must have completed the first semester of the aircraft maintenance curriculum, or equivalent. MOSELEY, NELSON.

153. **Aircraft Shop Practice.** The care and use of hand tools; use of taps and dies, lathes, drill presses, power saws, sprays, cleaners, and other shop equipment. I; 3. MOSELEY, NELSON.

154. **Aircraft Propellers.** The theory of and practical work on various types of propellers, both wood and metal. Inspection, removal, repair, balancing, and installation. II; 3. Prerequisite: Aviation 157. NELSON.

155. **Aircraft Mathematics.** A mathematical course for aircraft mechanics with emphasis on the use of decimals, ratio and proportion, formulas, equations, areas, and horsepower calculations. I; 3. CUSHMAN.

157. **Aircraft Engine Theory and Practice.** Theory of operation of internal combustion engines. Construction and advantages of different types of aircraft engines. Practical work in disassembly, cleaning, inspection of parts; checking tolerances to specifications; reassembly; valve and ignition timing procedures. Starting systems; carburetion; fuel and lubrication; propellers. I; 5. MOSELEY, NELSON.

158. **Aircraft Overhaul.** The complete disassembly of the aircraft, cleaning, inspecting, corrosion and rust treatment, painting of frame, recovering or patching, rejuvenation, rigging, alignment, assembly, engine installation, weight and balance, and other necessary work to prepare the airplane for flight. II; 3. APPLEGATE.

160. **Aircraft Rigging and Assembly.** Installation, operation, servicing, repair, adjustment, and inspection of aircraft controls and control surfaces. II; 2. APPLEGATE.

161. **Airport Shop Management.** Shop safety, purchasing, record keeping, inventories, accounting, job estimates, and foremanship. I; 3. BRYAN.

162. **Aircraft Systems and Appliances.** The inspection, repair, replacement, and maintenance of hydraulic systems, actuating systems, landing gears, fuel, vacuum, and oxygen systems. Practical work in the installation and maintenance of radios and instruments. II; 3. OTTERSON.

163. **Aircraft Woodworking.** Explanation of and instruction in the use and care of woodworking tools; the selection of materials used in aircraft construction; defects, drying, lumber storage, steam bending, laminating, gluing, testing, and inspection. Alterations and repairs will be performed to give practical experience. I; 2. APPLEGATE.

164. **Inspections, Forms and Reports.** Complete inspection following overhaul. Preflight, 25-hour, 100-hour, and annual inspections. Forms covering relicensing, bill of sale, repair, and alteration. Reports to Civil Aeronautics Administration and others. II; 3. OTTERSON.

165. **Aircraft Welding.** The theory and practice of welding. Use of regulators, torches, tips, hose lines, gauges, valves, and oxygen and acetylene supplies. Knowledge of brazing and silver soldering. Use of jigs, trammels, levels, and protractors. I; 2. APPLEGATE, OTTERSON.

167. **Aircraft Sheet Metal.** Sheet metal work on materials used in aircraft, classification of sheet metals, identification and characteristics, protective coatings, riveting, hand forming, stringer splicing, and general repairs. I; 2. OTTERSON.

168. **Seminar on Aircraft Maintenance.** Seminar in the current problems of aircraft maintenance. II; 2. Prerequisite: Sophomore standing. APPLEGATE.

169. **Aircraft Materials and Specifications.** Proper identification of all the materials used in aircraft design and repair. A.N. specifications, S.A.E. and manufacturers' standards. I; 1. APPLEGATE.

171. **Aircraft Finishing Methods.** The materials and methods used in covering and doping, including the preparation of surfaces for finishings, proper methods of finishing, finishing pigmented dope, fabric rejuvenation, troubles in aircraft finishing and their prevention, the operation and care of finishing room equipment. I; 3. OTTERSON.

## Courses for Advanced Undergraduates

NOTE: Aviation 205 and 206 may be taken concurrently.

**205. Flight Instructor Course.** Preparation of the commercial pilot for a Civil Aeronautics Administration rating as a flight instructor. Forty-eight classroom hours of preflight (ground school) study and a minimum of twenty-six hours of flight training (twenty hours dual and six hours solo) in two-place tandem aircraft. I, II; 3. Prerequisite: Possession of Commercial Pilot rating; junior standing; consent of Director of Institute. STONECIPHER and others.

**206. Instrument Flight Course.** Preparation of the commercial pilot for a Civil Aeronautics Administration instrument rating. Forty-eight classroom hours of preflight (ground school) study, twenty to thirty hours of instrument flight, and ten to twenty hours of Link training. I, II; 3. Prerequisite: Possession of Commercial Pilot rating; junior standing; consent of Director of Institute. NICKELS.

**210. Aviation in the Modern World.** A survey of the social, political, economic, and international aspects of aviation as related to life in the modern world. I or II; 3. Prerequisite: Sophomore standing. BRYAN.

**291. Special Rating (Single-Engine Sea).** Preparation of the commercial pilot for a Civil Aeronautics Administration Single-Engine Seaplane rating. Sixteen hours of preflight (ground school) training and fifteen hours of flight training in single-engine seaplane. S; 1. Prerequisite: Commercial Pilot rating; consent of Director of Institute. STONECIPHER.

**292. Special Rating (Multi-Engine Land).** Preparation of the commercial pilot for a Civil Aeronautics Administration Multi-Engine Land Airplane rating. Sixteen hours of preflight (ground school) training and fifteen hours of flight training in a multi-engine land airplane. II; 1. Prerequisite: Commercial Pilot rating; consent of Director of Institute. STONECIPHER.

# BACTERIOLOGY

*Professors:* H. O. HALVORSON (Head of Department), I. C. GUNSALUS, S. E. LURIA, S. SPIEGELMAN, F. W. TANNER (on leave).

*Associate Professors:* F. M. CLARK, G. I. WALLACE.

*Assistant Professor:* A. F. BORG.

*Assistants:* L. S. BARON, MARY K. BROWN, A. M. CAMPBELL, R. DEMARS, VIRGINIA GARDNER, L. HAGER, SHIRLEY NICE, MARION NYHOLM, N. G. ROTH, B. SAGIK, E. SCHULDT, A. STERN, G. STREISINGER, D. WALDHALM, H. YARBROUGH, JR.

## Requirements for L.A.S. Students

**Major:** Twenty hours chosen from the courses offered by this department exclusive of Bacteriology 104 and 300. In addition to the courses offered by this department, students may select Dairy Science 350 and Agronomy 304.

**Minors:** Twenty hours chosen from one or two of the following subjects: agronomy, botany, chemistry, entomology, physiology, and zoology. At least eight hours must be taken in each subject, if two are chosen. Other minors may be substituted with permission of the department.

## Courses for Undergraduates

**103. Bacteriology for Nurses.** Fundamentals in general and medical bacteriology designed to give student nurses a foundation in bacteriology necessary for nursing practice. I; 5. Offered in conjunction with a nursing school.

104. **Elementary Bacteriology.** Study of bacteria, yeasts, and molds; their morphology, ecology, and principal activities. Consideration is given to the importance of microorganisms in agriculture, industry, public health, communicable diseases, sanitation, etc. Lecture and laboratory. I, II; 5. Prerequisite: Sophomore standing, or consent of instructor. HALVORSON.

## Courses for Advanced Undergraduates

207. **Research and Special Problems.** I; 3 to 5. Prerequisite: Senior standing; twenty hours of bacteriology; consent of instructor. STAFF.

208. **Research and Special Problems.** II; 3 to 5. Prerequisite: Senior standing; twenty hours of bacteriology; consent of instructor. STAFF.

## Courses for Advanced Undergraduates and Graduates

300. **General Microbiology.** Emphasis is placed on the fundamental concepts and techniques of microbiology; methods of isolation, cultivation, and observation of bacteria. The morphological, physiological, and nutritional characteristics of the microorganisms and their role in nature and in infection and immunity will be considered. I, II; 5 hours, or 1 unit. Prerequisite: Botany 100 or Zoology 101 (or 104); two years of college chemistry to include organic; or consent of instructor. BORG.

306. **Principles of Experimental Bacteriology.** Attention is focused on the experimental basis of bacterial physiology, cytochemistry, and variation; the conditions which influence growth, death, and metabolism; interpretations of the cultural properties of bacteria in terms of the physiology of the bacterial cell. Laboratory experiments will be designed to illustrate the principles and techniques involved. I; 5 hours, or 1 unit. Prerequisite: Bacteriology 300; Chemistry 124 and 234, or equivalent; or consent of instructor. GUNSALUS, LURIA.

308. **Food and Applied Bacteriology.** Microbiology of foods; preservation, technology, analysis; food poisoning and food-borne intoxications. Laboratory, lectures, discussions, readings, and reports. I; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300; consent of instructor. CLARK.

309. **Nutrition and Cultivation of Microorganisms.** Nutritional and metabolic properties of representative groups of microorganisms; a comparative study of the ecology, selective isolation, cultivation of bacteria, and microbiological assays. II; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300; fifteen hours of chemistry including organic. CLARK.

326. **Pathogenic Bacteriology.** A study of the pathogenic bacteria; classification, morphology, cultural requirements, and reactions; toxins, diagnostic tests, methods of differentiation and recognition, and the diseases bacteria cause. Lecture and laboratory. I; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300. WALLACE.

327. **Immunology and Serology.** A survey of the field of immunology; prevention of disease, diagnosis, and preparation and use of biologicals in the treatment of disease. Lecture and laboratory. II; 5 hours, or 1 unit. Prerequisite: Bacteriology 326; consent of instructor. WALLACE.

351. **Viruses.** The study of filterable viruses as a branch of microbiology. Statistical, physical, and chemical properties of virus particles; analysis of host-virus interaction; origin and natural relations of viruses. II; 3 hours, or ¾ unit. Prerequisite: Bacteriology 300, or equivalent; Botany 100, or Zoology 101 (or 104), or equivalent; consent of instructor. LURIA.

# BANDS

*Professor:* M. H. Hindsley (Director).
*Assistant Professors:* E. D. Kisinger, A. J. McDowell, H. O. Sexton.
*Instructors:* M. C. Howe, P. W. Price, L. A. Starr.
*Assistant:* D. K. McCarty.

## Courses for Undergraduates

The following courses are open to men and women students who have been accepted by examination for membership in one of the University Bands—Concert Band, First Regimental Band, Second Regimental Band. Assignments are made according to proficiency and instrumentation. New students should make appointments for auditions at the Bands Office, in person or by mail.

Completion of the courses involves, in addition to the regular schedule of rehearsals (three hours weekly), participation in the public appearances of the bands. Credit is given only as a substitute for credit in military courses required for freshmen and sophomores.

**101. Freshman Band.** I; 1. Hindsley, Howe, Kisinger, McCarty, McDowell, Price, Sexton, Starr.

**102. Freshman Band.** II; 1. Hindsley, Howe, Kisinger, McCarty, McDowell, Price, Sexton, Starr.

**103. Sophomore Band.** I; 1. Hindsley, Howe, Kisinger, McCarty, McDowell, Price, Sexton, Starr.

**104. Sophomore Band.** II; 1. Hindsley, Howe, Kisinger, McCarty, McDowell, Price, Sexton, Starr.

## Courses for Advanced Undergraduates

**201. Junior Band.** I; no credit. Hindsley, Kisinger, McDowell, Sexton, Starr.

**202. Junior Band.** II; no credit. Hindsley, Kisinger, McDowell, Sexton, Starr.

**203. Senior Band.** I; no credit. Hindsley, Kisinger, McDowell, Sexton, Starr.

**204. Senior Band.** II; no credit. Hindsley, Kisinger, McDowell, Sexton, Starr.

# BIOLOGICAL SCIENCES

## Courses for Undergraduates

**100. Biological Resources of Latin America.** A survey of plant and animal distribution and resources of Latin America and their economic significance, with emphasis upon their exploitation and vocational opportunities; human biology and public health problems in Latin America. II; 2. Credit in this course may not be applied to fulfillment of major requirements in the departments of Botany and Zoology. Prerequisite: Five hours of biological sciences, or a one-year course in high school biology and consent of instructor; sophomore standing. Fuller.

## Courses for Advanced Undergraduates and Graduates

**331. Physico-Chemical Biology. Part I: Radiobiology.** Same as Botany 331 and Physiology 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit. Prerequisite: One year of biology, physics, chemistry, and mathematics.

332. **Physico-Chemical Biology. Part II: Photobiology.** Same as Botany 332. Lecture and seminar course dealing with interaction of light and living matter (photosynthesis, phototropism, vision, bioluminescence). I; 3 hours, or 1 unit. Prerequisite: One year of physics, chemistry, and biology; consent of instructor. Offered in 1951-1952 and in alternate years. RABINOWITCH.

333. **Physico-Chemical Biology. Part III: Electrobiology.** Same as Botany 333 and Physiology 333. Potentials produced by and effects of potentials upon living organisms. Lectures, reports, and demonstrations. I; 3 hours, or ¾ unit. Prerequisite: Ten hours of biology, four hours of physical chemistry, and ten hours of physics. Offered in 1952-1953 and in alternate years. PROSSER.

354. **Biophysics Laboratory.** Same as Physics 354. Laboratory experiments in optics, electricity, and nuclear physics designed to familiarize the student with the physical apparatus and techniques useful in biophysics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. RAWCLIFFE.

# BOTANY

*Professors:* O. TIPPO (Chairman of Department), R. EMERSON, H. J. FULLER, C. F. HOTTES (Emeritus), G. N. JONES, E. I. RABINOWITCH, K. B. RAPER (Visiting), M. M. RHOADES, A. G. VESTAL.

*Associate Professors:* L. SHANOR, W. N. STEWART.

*Assistant Professors:* J. R. LAUGHNAN, J. F. NANCE.

*Research Associates:* A. S. HOLT, S. NISHIMURA, D. SCHWARTZ.

*Associate:* STELLA M. HAGUE (Emerita).

*Assistants:* SHIRLEY G. BEYM, W. A. BRUN, FRANCES B. COTTRELL, T. DELEVORYAS, ELLEN DEMPSEY, BETH E. GOODRICH, R. C. HECKER, J. L. HOWE, H. H. KUEHN, F. C. LANE, R. W. LICHTWARDT, M. LIN, E. JEANNE MORGAN, P. A. PETERSON, HOPE H. PUNNETT, D. L. RICHARDSON, Y. SHIGEMURA, M. GRACE SOMERS, W. L. STERN, RHETA H. SWAIN, S. H. TULPULE, S. L. WILSON.

## Requirements for L.A.S. Students

**Major:** Twenty hours of botany excluding Botany 100, Division of General Studies 131, 132, and Biological Sciences 100, and including Botany 120 or 304, 130, and 160, and at least five hours in courses listed for advanced undergraduates and graduates.

**Minors:** Twenty hours in one or two departments chosen in consultation with the chairman of the department from the following list: agronomy, bacteriology, chemistry, entomology, geography, geology, horticulture, mathematics, physics, physiology, plant pathology, and zoology. At least eight hours must be taken in each department, if two are chosen.

NOTE: Students preparing to teach high school botany or biology should see Professor H. J. Fuller, adviser for teacher-training curriculum in biology, 301 Natural History Building, at the time of their registration.

## Courses for Undergraduates

100. **General Botany.** The basic principles of plant structure, growth, physiology, reproduction, evolution, and distribution, with special emphasis upon the role of the plant kingdom in the cycles of nature and in human life. This course fulfills a portion of the general education requirement in biological sciences in the College of Liberal Arts and Sciences. Students must register in one lecture section, one discussion section, and one laboratory section. (This course replaces Bot. 100-101, 104, and 105). I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. FULLER (in charge), SHANOR, STEWART, TIPPO.

116. **Economic Botany.** Uses of plants and plant products by man; origin of cultivated plants and their relation to human history. II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. FULLER.

120. **Survey of the Plant Kingdom.** A study, at an elementary level, of the life histories of plants representative of algae, fungi, mosses, ferns, and seed plants. II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. STEWART.

130. **Plant Physiology.** General consideration of the important plant functions and processes. I; 5. Prerequisite: Botany 100; one course in organic chemistry (Chemistry 132, or 133, or 234, or equivalent). NANCE.

160. **Introductory Systematic Botany (Plant Taxonomy).** Classification and identification of flowering plants, with special reference to the local flora and the needs of high school teachers. Occasional field trips required. II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. JONES.

## Courses for Advanced Undergraduates

226. **Poisonous Plants.** The first part of the course deals with the identification of plants poisonous to animals, while the second part deals with the diagnosis, treatment, and prevention of plant poisonings. II; 2. Prerequisite: Botany 100 or equivalent; third-year standing in veterinary curriculum. JONES, LINK.

280. **Forest Ecology.** American trees and their requirements; forest sites, stands, and types. II; 3. Prerequisite: One year of botany; junior standing, or registration in preforestry curriculum. VESTAL.

293. **Honors Course.** I; 2. Prerequisite: Fifteen hours of botany; senior standing. STAFF.

294. **Honors Course.** II; 2. Prerequisite: Fifteen hours of botany; senior standing. STAFF.

## Courses for Advanced Undergraduates and Graduates

300. **Individual Topics.** For seniors and first-year graduate students who wish to study individual problems and topics not assigned in other courses. Undergraduates may not offer more than five hours in Botany 300 and 301 toward a bachelor's degree, nor graduate students more than one unit in Botany 300 and 301 toward a master's degree. I; 2 to 5 hours, or ¼ to ½ unit. Prerequisite: Botany 100; ten hours of advanced work in botany or another biological science; senior standing. STAFF.

301. **Individual Topics.** For seniors and first-year graduate students who wish to study individual problems and topics not assigned in other courses. Undergraduates may not offer more than five hours in Botany 300 and 301 toward a bachelor's degree, nor graduate students more than one unit in Botany 300 and 301 toward a master's degree. II; 2 to 5 hours, or ¼ to ½ unit. Prerequisite: Botany 100; ten hours of advanced work in botany or another biological science; senior standing. STAFF.

304. **General Plant Morphology.** A survey of the principles of plant morphology as exemplified by the various plant groups. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: Botany 100, or Division of General Studies 131 and 132; senior standing, or consent of instructor.

306. **Biology for Teachers.** Same as Zoology 306. A teacher-training and review course for those engaged in or preparing for teaching general biology in high school. II; 2 hours, or ¼ or ½ unit. Prerequisite: Botany 100; Zoology 101. FULLER, MATTESON.

307. **Fruit Diseases.** Same as Horticulture 307 and Plant Pathology 307. Symptomatology, control measures. Laboratory and field studies of representative diseases. I; 3 hours, or ½ unit. Prerequisite: Botany 317 or 372. Offered in 1951-1952 and in alternate years. ANDERSON.

308. **Vegetable and Canning Crop Diseases.** Same as Horticulture 308 and Plant Pathology 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Botany 317 or 372. Offered in 1952-1953 and in alternate years. LINN.

317. **Plant Pathology.** Same as Agronomy 317, Horticulture 317, and Plant Pathology 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. LINFORD.

320. **Cytology.** Study of nuclear and cell division with emphasis on chromosome structure and behavior. Various aspects of cytological behavior are considered in relation to genetics and development. II; 4 hours, or 1 unit. Prerequisite: One year of botany including Botany 340; senior standing. RHOADES.

322. **Genetics.** A basic treatment of the facts and fundamental principles of genetics, with special emphasis on plants. I; 4 hours, or 1 unit. Prerequisite: One year of botany; senior standing. LAUGHNAN.

325. **Paleobotany.** Same as Geology 325. The structure, phylogeny, and geological distribution of representative fossil plants. Two or three field trips. II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 100, or Division of General Studies 131 and 132; Geology 101, or consent of instructor. Offered in 1952-1953 and in alternate years. STEWART.

331. **Physico-Chemical Biology. Part I: Radiobiology.** Same as Biological Science 331 and Physiology 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit. Prerequisite: One year of biology, physics, chemistry, and mathematics.

332. **Physico-Chemical Biology. Part II: Photobiology.** Same as Biological Science 332. Lecture and seminar course dealing with interaction of light and living matter (photosynthesis, phototropism, vision, bioluminescence). I; 3 hours, or 1 unit. Prerequisite: One year of physics, chemistry, and biology; consent of instructor. Offered in 1951-1952 and in alternate years. RABINOWITCH.

333. **Physico-Chemical Biology. Part III: Electrobiology.** Same as Biological Science 333 and Physiology 333. Potentials produced by and effects of potentials upon living organisms. Lectures, student reports, and demonstrations. I; 3 hours, or ¾ unit. Prerequisite: Ten hours of biology, four hours of physical chemistry, and ten hours of physics. Offered in 1952-1953 and in alternate years. PROSSER.

335. **Plant Physiology: Metabolic Transformations.** II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: One year of botany including Botany 130; one year of chemistry. NANCE.

340. **Histological Technic.** Survey of technics used in the preparation of plant tissues for microscopical examination. II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: One year of botany, or ten hours of zoology. TIPPO.

344. **Spermatophytes.** Morphology of seed plants. II; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany including Botany 304; senior standing. Offered in 1951-1952 and in alternate years.

345. **Plant Anatomy.** Study of the internal structure of vascular plants with special emphasis on function and evolutionary history. I; 3 to 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. TIPPO.

360. **Advanced Systematic Botany.** Phylogenetic study of flowering plants; relationship of the principal orders and families; problems of nomenclature; identification of specimens. I; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 160. Offered in 1951-1952 and in alternate years. JONES.

366. **Field Botany.** Identification and classification of native and naturalized flowering plants of eastern North America. S; 3 or 5 hours, or ½ or 1 unit. Prerequisite: One course in botany; consent of instructor. JONES.

372. **General Mycology.** Structure, classification, and identification of fungi, including those of economic importance. II; 4 hours, or 1 unit. Prerequisite: One year of botany, bacteriology, entomology, or zoology; senior standing, or consent of instructor. SHANOR.

377. **Diseases of Field Crops.** Same as Agronomy 377 and Plant Pathology 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Botany 317 or Agronomy 121, or consent of instructor. BEVER, GERDEMANN.

**379. Research Methods in Plant Pathology.** Same as Agronomy 379, Horticulture 379, and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Botany 317; senior standing. GOTTLIEB, GERDEMANN, THORNBERRY.

**381. Plant Ecology.** Principles of ecology, exemplified by vegetation and environments of Illinois. I; 3 hours, or ½ unit. Prerequisite: One year of botany. VESTAL.

**385. Plant Geography of North America.** Vegetation regions and principal subdivisions; environments, plant cover, floras. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. Offered in 1951-1952 and in alternate years. VESTAL.

**386. Plant Geography of Continents Other Than North America.** Regions, vegetation-types, notable species. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. Offered in 1952-1953 and in alternate years. VESTAL.

**388. Ecology: Plant Communities.** Characteristics, types, development, and classification of communities. II; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany, including Botany 280 or 381. Offered in 1951-1952 and in alternate years. VESTAL.

## BUSINESS ORGANIZATION AND OPERATION

### (Including Accountancy, Business Law, Management, Marketing, and Secretarial Training)

*Professors:* H. T. SCOVILL (Head of Department), A. G. ANDERSON, H. H. BAILY, F. H. BEACH, L. A. BRYAN, P. D. CONVERSE, E. R. DILLAVOU, E. J. FILBEY (Emeritus), C. J. GAA, P. M. GREEN, H. W. HUEGY, A. C. LITTLETON, M. J. MANDEVILLE, L. MOREY, C. A. MOYER, H. L. NEWCOMER, F. A. RUSSELL (on leave), C. H. SANDAGE, C. F. SCHLATTER, E. P. STRONG, E. L. THEISS (Emeritus).

*Associate Professors:* A. C. CONDON, R. I. DICKEY, R. DUBIN, F. M. JONES, R. K. MAUTZ, P. C. ROBERTS, S. C. ROBINSON, H. G. WALES.

*Assistant Professors:* H. E. BREEN, J. M. CARRITHERS, C. C. CURTIS, C. C. DELONG, H. M. EDWARDS, MABEL R. HAGAN, R. V. MITCHELL, W. E. THOMAS, N. D. WAKEFIELD, N. WEDDING.

*Lecturer:* I. A. COCHRUN.

*Instructors:* G. D. BRIGHTON, M. N. BROUSSARD, R. H. COLE, C. M. CRAWFORD, D. A. HENNING, W. G. KELL, ALICE C. KIRKPATRICK, DOROTHY LITHERLAND, R. E. LUNDQUIST, G. E. MARTIN, ELIZABETH MELSON, W. O. MORRIS, MILDRED E. REED, M. D. RICHARDS, F. L. ROBERTS, C. SPIVEY, W. A. TERRILL.

*Assistants:* B. F. ASCHBACHER, B. L. BARNES, H. L. CROUSE, L. M. DEBOER, C. L. DUNN, D. J. HAY, A. F. KNAPPER, C. LAWRENCE, P. P. LEBRETON, K. W. PERRY, R. E. SCHLOSSER, D. W. SCOTTON, D. H. SKADDEN, A. R. WYATT, V. K. ZIMMERMAN.

Courses offered in the Department of Business Organization and Operation deal with the problems encountered from day to day in the several departments of a private business (including the organization thereof); and in the business departments of public or quasi-public institutions. They deal with accountancy in all of its phases; organization; marketing in its several phases; management; business law; and secretarial training.

A student in the College of Commerce and Business Administration does not select a major or a minor in these subjects, but he takes the courses as outlined in the several curricula of the College. Each curriculum or field of concentration is so constituted as to offer the student a good general knowledge of business and economics as well as a more intensive preparation in the field in which he is most interested.

Any of the courses listed below may be taken by students from other branches or departments of the University who meet the prerequisites.

## ACCOUNTANCY

### Courses for Undergraduates

**101. Principles of Accounting.** Simple transactions, general ledger accounts, books of original entry, closing process, trial balances, financial statements, accounting for negotiable instruments, controlling accounts, adjusting entries. Students who present one unit of bookkeeping for entrance will not be allowed credit for Accountancy 101, and should register in Accountancy 102. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. CARRITHERS, THOMAS, and others.

**102. Principles of Accounting.** Similar to Accountancy 101. For those who present one unit of entrance credit in bookkeeping. Students who have failed Accountancy 101 are permitted to register in Accountancy 102 and receive credit as in Accountancy 101 if their final grade is "C" or above. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. THOMAS and others.

**105. Accounting Procedure.** Relation of business documents to the accounts; fundamentals of partnership and corporation accounting; business forms and records; financial statement analysis. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Accountancy 101 or 102. CARRITHERS, WAKEFIELD, and others.

**106. Elementary Cost Accounting.** Accounting for production management. Principles and methods of accounting for managerial control of costs of production. I, II; 3. Prerequisite: One year of accountancy; sophomore standing; credit or registration in Economics 102 or 108. DICKEY, SCHLATTER, THOMAS, and others.

**108. Intermediate Accounting.** Consideration at the intermediate level of accounts and transactions peculiar to the partnership and corporation types of organization and of modern basic concepts of accounting theory; interpretation of financial statements and analysis of the principal accounts represented therein. I, II; 3. Prerequisite: Forty-five credit hours; Accountancy 105. KELL, LITHERLAND, MAUTZ, C. A. MOYER, TERRILL, WAKEFIELD, and others.

**121. Business Computations.** Primarily for students registered in the commercial teaching curriculum. Fundamental processes, annuities, bond valuations, installment sales, mark-ups and mark-downs, application of logarithms, metric system, simple algebraic and trigonometric computations. I, II; 3. TERRILL.

### Courses for Advanced Undergraduates

**201. Fundamentals of Accounting.** Same as Law 201. A survey course in the principles of accounting for students registered in schools and colleges other than Commerce. Subjects covered are similar to those listed under Accountancy 101 and 105. This course or its equivalent is required of students in the four-year law curriculum. I, II; 3. DICKEY and others.

**221. Current Accounting Topics.** Consideration of authoritative pronouncements dealing with controversial problems of accounting practice. II; 2. Prerequisite: Accountancy 308; senior standing. CARRITHERS, MAUTZ.

**265. Hotel Accounting.** Accounting for food preparation and service in hotels and restaurants; food inventories, food control. I; 3. Prerequisite: Accountancy 201, or 101 and 105. ZIMMERMAN.

**274. Federal Income Tax Accounting.** Basic discussion of history, theory, and broad outlines of federal income taxation, together with the more important problems of a less advanced and difficult nature. I, II; 3. Prerequisite: Accountancy 108. BRIGHTON, GAA.

**291. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in accountancy. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of accountancy. I; 2 to 4. SCHLATTER and others.

292. **Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in accountancy; Option B—a comprehensive examination, six hours in length, covering a review of various aspects of accountancy. II; 2 to 4. SCHLATTER and others.

295. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. SCHLATTER and others.

296. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. II; 3 to 5. SCHLATTER and others.

## Courses for Advanced Undergraduates and Graduates

308. **Advanced Accounting.** Reserves, sinking funds, actuarial methods, investments, partnerships, statements for special purposes, receiverships, consolidated balance sheets, foreign exchange. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 106 and 108; an average of "C" or better in preceding courses in accountancy. BREEN, LITHERLAND, NEWCOMER, TERRILL, and others.

324. **Accounting Systems.** A discussion of the systems used by contractors, department stores, finance companies, building and loan associations, banks, insurance companies, brokers, water companies. I, II; 2 hours, or ½ unit. Prerequisite: Accountancy 106 and 108. BAILY.

341. **Governmental Accounting.** Accounts of institutions, municipalities, and of state and federal governments; organization; procedure, budget, accounts and records, reports, audits. I, II; 2 hours, or ½ unit. Prerequisite: Accountancy 108. BRIGHTON, LITHERLAND, LUNDQUIST.

362. **Business Budgets and Accounting Control.** Procedures used in the preparation of business budgets and the principles underlying these procedures. A complete budget is prepared by the student for a typical manufacturing company. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 108 (Accountancy 106 for students majoring in industrial administration). THOMAS.

366. **Advanced Cost Accounting.** Advanced accounting for production management; principles and methods of accounting for managerial control of costs of production through the use of standards. I, II; 2 hours, or ½ unit. Prerequisite: Minimum of nine hours of accountancy including Accountancy 106. DICKEY, SCHLATTER, THOMAS.

371. **Auditing.** Ethics of the accounting profession; auditing standards and procedures; programs of audit of various accounts; construction and indexing of working papers; reports to clients. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 308. BREEN, MAUTZ, WAKEFIELD.

372. **Auditing Problems and Cases.** Application of auditing principles in verification of financial statements; preparation of reports; case studies applicable to specific industries; current trends. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 371. BREEN, MAUTZ, C. A. MOYER.

374. **Advanced Income Tax Problems.** Practical and theoretical training in the more common and important provisions of the federal income tax, advanced problems, tax case research and preparation. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Accountancy 274 and 308. GAA.

377. **Advanced Problems.** Consolidated statements, foreign subsidiaries, insurance, estates, theory, general statements. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Credit or registration in Accountancy 371; senior standing. CARRITHERS, C. A. MOYER, NEWCOMER, SCOVILL, WAKEFIELD.

378. **C.P.A. Problems.** Selected problems from C.P.A. examinations; analysis and revision of statements, partnerships, corporations, quasi-reorganizations, mergers, and others; theory, auditing, ethics. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Accountancy 377. BREEN, CARRITHERS, C. A. MOYER, NEWCOMER, SCOVILL.

## BUSINESS LAW

### Courses for Undergraduates

100. **Basic Principles of Business Law.** Basic principles in business law covering the subjects of contracts, sales, negotiable instruments, and agency. Credit toward graduation will not be given for Business Law 201, 202, or 261 in addition to Business Law 100. I, II; 3. Prerequisite: Accountancy 105; Economics 102; forty-five credit hours.

### Courses for Advanced Undergraduates

201. **General Principles of Business Law.** Principles of business law, covering the fields of contracts, agency, and personal property, including sales. I, II; 3. Prerequisite: Accounting 105; Economics 103. CURTIS, DILLAVOU, MORRIS, P. C. ROBERTS, and others.

202. **General Principles of Business Law.** Principles of business law, covering negotiable instruments, partnerships, and corporations. I, II; 3. Prerequisite: Business Law 201. KIRKPATRICK, MORRIS, P. C. ROBERTS, and others.

261. **Summary of Business Law.** Principles of business law, including contracts, agency, sales, negotiable instruments, and business organizations. For non-commerce students. I, II; 3. CURTIS, KIRKPATRICK, and others.

### Courses for Advanced Undergraduates and Graduates

301. **The Law of Security Transactions and Banking.** Significant phases of law in the fields of pledges, chattel mortgages, conditional sales, suretyship, insurance, real property, banks and banking, and bankruptcy. Under real property, real estate mortgages, landlord and tenant and mechanics liens are considered as well as the general principles of real property. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Credit or registration in Business Law 202; senior standing. DILLAVOU.

302. **Wills, Estates, and Trusts.** A study of the basic legal and management principles and practices involved in the planning and administration of wills, estates, and trusts. I; 3 hours, or ½ to 1 unit. Prerequisite: Business Law 201 and 202. P. C. ROBERTS.

## MANAGEMENT

### Courses for Undergraduates

101. **Industrial Organization and Management.** Organization plans, administrative policies, and management problems with special attention to manufacturing units. I, II; 3. Students will not be given credit toward graduation for both Management 101 and Mechanical Engineering 281. Prerequisite: Economics 102, or consent of instructor; junior standing. ANDERSON, HENNING, RICHARDS, SPIVEY, and others.

### Courses for Advanced Undergraduates

204. **Industrial Purchasing.** Organization and operation of the purchasing department, basic materials, substitutes, imitations, sources of supply, catalogs, terms, discounts, relation to salesmen. I, II; 3. Prerequisite: Management 101; Marketing 101; senior standing. HENNING, SPIVEY.

205. **Production Planning and Control.** The development of methods and systems for the control and flow of work through manufacturing operations. I, II; 3. Prerequisite: Management 101. CROUSE, RICHARDS.

221. **Work Simplification and Time Study.** Principles and methods of determining job times by motion analysis and time studies. I, II; 3. Students will not be given credit toward graduation for both Management 221 and Mechanical Engineering 232. Prerequisite: Management 101. CROUSE.

245. **Office Management.** An introductory course in the techniques of office management. It deals with the organization element, the human element, the physical element, the operation element, and the control element. I, II; 3. Prerequisite: Accountancy 105; Economics 103. LeBreton, Strong.

246. **Office Equipment.** The functions, applications, and limitations of various fundamental types of office equipment as related to modern business management. I, II; 2. Prerequisite: Senior standing. Melson.

251. **Airport Management.** Types of ownership and control; financial, physical, and economic aspects of airport location; airport planning, zoning, legal aspects of operation, pricing airport services; organization of staff, promotion; accounting, purchasing, personnel, maintenance, and safety. I, II; 3. Prerequisite: Economics 102 or 108. Thomas.

252. **Airline Management.** Problems arising in the management of airlines, station organization, scheduling, purchasing, air express, air mail, advertising, interline traffic. I, II; 3. Prerequisite: Economics 102 or 103, or 108. Thomas.

291. **Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in management. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of management. I; 2 to 4. Mandeville.

292. **Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in management. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of management. II; 2 to 4. Mandeville.

295. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. Mandeville.

296. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen hours if divided between this and any other department. II; 3 to 5. Mandeville.

## Courses for Advanced Undergraduates and Graduates

301. **Management in Manufacturing.** Internal problems of production and efficient control in factories. I, II; 3 hours, or ½ unit. Prerequisite: Management 101. Mandeville, Richards.

311. **Administrative Policies and Organization.** Development of administrative organizations and the determination of policies for the integration of major activities of a business enterprise. I, II; 3 hours, or ½ unit. Prerequisite: Management 101; Marketing 101; senior standing. Mandeville.

312. **Problems of Administration and Organization.** Same as Labor and Industrial Relations 312. Problems of the individual and groups brought about by modern industrial organizations and techniques. Motivations for work and cooperation between executives and different economic and social groups. I, II; 3 hours, or ½ unit. Prerequisite: Management 101, or equivalent. Dubin.

340. **Jurisprudence, Business Methods, and Ethics.** Principles of law, business procedures, and professional ethics of importance to members of the veterinary profession; animal disease and related regulatory laws and their administration; federal procedure under animal disease and food and meat inspection laws. II; 3. Prerequisite: Senior standing in the veterinary curriculum. Hannah, Carrithers, Woods.

362. **Job Wage and Contract Administration.** An advanced, specialized treatment of the techniques, methods, and problems current in the wage and salary field. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Any one of the following courses or their equivalent: Economics 240, 248, Psychology 145, 290. Henning.

## MARKETING

### Courses for Undergraduates

**101. Principles of Marketing.** The functions, commodities, and middlemen involved in the marketing of goods and services; the policies and problems involved in the operation of market institutions. I, II; 3. Prerequisite: Economics 102 or 108; junior standing. CONVERSE, CRAWFORD, HUEGY, MARTIN, MITCHELL, F. L. ROBERTS, and others.

### Courses for Advanced Undergraduates

**211. Principles of Retailing.** The fundamentals of buying, sales promotion, pricing, control, and store finance. I, II; 3. Prerequisite: Marketing 101. JONES, F. L. ROBERTS, and others.

**212. Retail Sales Promotion.** The methods of determining where and what to promote, the guideposts in selecting merchandise for promotion, the budgeting and planning of sales promotion activities, the carrying out of the plan, external and internal methods of promotion business, the coordination of sales promotion activities. II; 2. Prerequisite: Marketing 211. JONES.

**271. Salesmanship.** Brief historical review of selling; fundamentals and technic of salesmanship today. I, II; 2. Credit is not given in both Marketing 271 and 272. Prerequisite: Marketing 101. BEACH and others.

**272. Industrial Selling.** A survey course in marketing and salesmanship for non-commerce students interested in selling industrial products. I, II; 3. Students may not receive credit for both Marketing 271 and 272 or Marketing 101 and 272. COCHRUN, HAY.

**281. Introduction to Advertising.** Same as Journalism 281. A survey of the economics, psychology, and philosophy of advertising; preparation of advertisements; selection of media and organizational structure. I, II; 3 hours. Prerequisite: Credit or registration in Marketing 101. FRYBURGER, GENTRY, MARIEN, MCCLURE.

**282. Advertising Procedures.** Same as Journalism 282. This course is designed to give students who do not wish to major in advertising an opportunity to become familiar with the basic elements of typography, copy, and layout. Students will not be given credit toward graduation for both Marketing 282 and 382. I, II; 3. Prerequisite: Marketing 281 or Journalism 281. WALES.

**283. Current Advertising Developments.** Same as Journalism 283. An analysis of problems, practices, and prospects in the field of advertising as viewed by current practitioners and writers. I, II; 1. Prerequisite: Senior standing and major in advertising or consent of instructor. SANDAGE.

**288. Sales Writing.** Same as Journalism 288 and Rhetoric 271. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151, or consent of instructor. MAGUIRE, SARGENT, TUCKER.

**291. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in marketing. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of marketing. I; 2 to 4. HUEGY, WEDDING, and others.

**292. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in marketing. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of marketing. II; 2 to 4. HUEGY, WEDDING, and others.

**295. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. CONVERSE and others.

**296. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department II; 3 to 5. CONVERSE and others.

## Courses for Advanced Undergraduates and Graduates

**305. Contemporary Problems in Marketing Management.** The problems which marketing managers are currently facing and an analysis of the policy decisions they must make to operate effectively. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101; senior standing. MITCHELL.

**315. Retail Buying.** Principles and procedures in buying for resale. Organization for buying, analysis of customer demand, model stock plans, sources of supply, resident buying, cooperative and central buying, foreign buying, selection of merchandise, and trade relations. I, II; 2 hours, or ½ unit. Prerequisite: Marketing 211. JONES.

**321. Marketing Research and Policies.** The basic techniques used in business research and specific research projects, and how their findings are used in the formulation of marketing policies. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101. CRAWFORD, MARTIN.

**323. Problems in Business Research.** Selected problems in the field of commercial research. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Marketing 321. CONVERSE, MARTIN.

**325. Sales and Distribution Cost Analysis.** Basic techniques and principles of sales and distribution cost analysis for management control of marketing activities. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101 and senior standing for commerce students, or consent of instructor. MITCHELL.

**331. Grain Grading and Marketing.** Same as Agronomy 331 and Agricultural Economics 331. Factors affecting the quality of grain crops; standards employed in their classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

**332. Marketing Livestock.** Same as Agricultural Economics 332. Livestock market practice as applied in current marketing operations. II; 2 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or consent of instructor. W. J. WILLS.

**333. Marketing Horticultural Products.** Same as Agricultural Economics 333 and Horticulture 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or twelve hours of horticulture. KELLY.

**334. Marketing Dairy Products.** Same as Agricultural Economics 334 and Dairy Science 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

**345. Credits and Collections.** Retail and mercantile credit and collection principles and practices. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101. F. L. ROBERTS, SCOTTON, and others.

**349. Trade Associations and Commercial Organizations.** Principles of trade association and Chamber of Commerce organization and management. II; 2 hours, or ½ unit. Prerequisite: Marketing 101; Business Law 201; senior standing. WEDDING.

**372. Advanced Salesmanship.** An application of sales techniques to actual selling situations. Students make sales presentations, and critical appraisals are given. I, II; 2 hours, or ¼ unit. Prerequisite: Marketing 271. BEACH, WALES.

**373. Sales Management.** Modern sales organization; selling problems of manufacturers, wholesalers, and retailers; management of salesmen. I, II; 2 hours, or ½ unit. Prerequisite: Marketing 271. BEACH.

**382. Advertising Copy and Layout.** Same as Journalism 382. Theory and practice of advertising copy writing and layout for newspaper, magazine, and direct mail. Advertising planning for the local advertiser. Use of consumer and market surveys, copy-testing methods, and advertising readership studies. I, II; 4 hours, or 1 unit. Students will

not be given credit toward graduation for both Marketing 382 and 282. Prerequisite: Marketing 281 or Journalism 281; Journalism 204. MILLICAN and others.

383. **Advertising Media.** Same as Journalism 383. Analysis of the various advertising media in terms of markets served and factors to consider in the selection of media. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281 or Marketing 281. FRYBURGER.

384. **Advertising Campaigns.** Same as Journalism 384. Planning and execution of an advertising campaign; market and consumer research; development and allocation of advertising budget; organization and functions of advertising agency; choice of advertising appeals; selection of media; preparation of advertisements—copy and layout. I, II; 3 hours, or ½ unit. Graduate students may not receive credit for both Marketing 384 and 387. Prerequisite: Marketing 382 and 383. WEDDING.

385. **Advertising Promotion and Sales.** Same as Journalism 385. Sales problems, advertising promotion, advertising research, market research. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Marketing 382. MCCLURE.

386. **Radio Advertising.** Same as Journalism 386. Economics, standards, and ethics as applied to radio commercials; sponsorship, rates, and advertising techniques, including merchandising, marketing, servicing, and sales; preparation and presentation of radio advertising copy, measurements, and listener surveys. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281 or Marketing 281. SANDAGE.

387. **Advertising Policies and Problems.** Same as Journalism 387. Analysis of actual advertising situations and study of how such situations were or might have been met. Consideration given to management and technical problems at both the national and retail levels. I, II; 3 hours, or ½ to 1 unit. Graduate students may not receive credit for both Marketing 384 and 387. Prerequisite: Journalism 281 or Marketing 281. WALES, WEDDING.

## SECRETARIAL TRAINING

### Courses for Undergraduates

101. **Beginning Typewriting.** A beginning course in typewriting. To be taken concurrently with Secretarial Training 111. Credit toward graduation is granted only to those in the curricula in commercial teaching or secretarial training. No others are admitted to the course. I, II; 2. KNAPPER.

102. **Intermediate Typewriting.** An intermediate course in typewriting for prospective teachers of that subject. To be taken concurrently with Secretarial Training 112. Credit toward graduation is granted only to those registered in the curricula in commercial teaching or secretarial training. No others are admitted to the course. I or II; 2. Prerequisite: Secretarial Training 101, or passing of proficiency examination. KNAPPER, REED.

103. **Advanced Typewriting.** An advanced course in typewriting for prospective teachers of that subject. To be taken concurrently with Secretarial Training 113. Credit toward graduation is granted only to those registered in the curricula in commercial teaching or secretarial training. No others are admitted to the course. I or II; 2. Prerequisite: Secretarial Training 102, or passing of proficiency examination. REED.

111. **Beginning Shorthand.** A beginning course in Gregg shorthand. To be taken concurrently with Secretarial Training 101. Credit toward graduation is granted only to those registered in the curricula in commercial teaching or secretarial training. No others are admitted to the course. I or II; 3. CONDON, HAGAN.

112. **Intermediate Shorthand.** An intermediate course in Gregg shorthand for prospective teachers of that subject. To be taken concurrently with Secretarial Training 102. Credit toward graduation is granted only to those students registered in the curricula in commercial teaching or secretarial training. No others are admitted to the course. I or II; 3. Prerequisite: Secretarial Training 111, or passing of proficiency examination. CONDON, REED.

113. **Advanced Shorthand.** An advanced course in Gregg shorthand for prospective teachers of that subject. To be taken concurrently with Secretarial Training 103. Credit toward graduation is granted only to those students registered in the curriculum in commercial teaching or secretarial training. No others are admitted to the course. I or II; 3. Prerequisite: Secretarial Training 112, or passing of proficiency examination. CONDON, REED.

### Courses for Advanced Undergraduates

222. **Advanced Dictation and Reporting.** This course aims to develop an ability to take dictation at high rates of speed (140 words per minute and above) and to apply this ability to the taking of dictated material in a variety of types of reporting activities. II; 3. Prerequisite: Secretarial Training 113. CONDON.

233. **Executive Secretarial Practice.** This course presents some of the practical problems a secretary may encounter. Through practical discussion of work situations, it aims to broaden the point of view of the student and to aid him in developing efficient office work habits. II; 2. Prerequisite: Secretarial Training 113. MELSON.

241. **Records Management.** This course aims to assist those preparing for a career in business in recognizing the need for a records department with sufficient authority and control to make the functions of filing and record keeping distinct in the organizational structure. II; 2.

### Courses for Advanced Undergraduates and Graduates

322. **Survey of Shorthand for Teachers.** A demonstration and skill-building course designed to improve all phases of shorthand knowledge, with special emphasis on an integrated presentation of the theory principles of Gregg Shorthand Simplified, transcription training, and speed building. S; 3 hours, or ½ to 1 unit. Prerequisite: Six hours credit in shorthand or equivalent. Graduate credit is limited to those students registered in the programs leading to the degree of Master of Education and the Advanced Certificate in Education. CONDON.

361. **Office Equipment (for Teachers).** Designed to teach the operation of office equipment and to help in the planning of courses in the subject, with some emphasis on the operation techniques. Also included will be such topics as organization of an office machines course, selection of minimum and maximum equipment and its cost, how to recognize community needs for specific equipment, the care to be given machines, the service needed, teaching aids available, and the production standards students need for threshold jobs. S; 4 hours, or 1 unit. Prerequisite: Senior standing. Graduate credit is limited to those students registered in the programs leading to the degree of Master of Education and the Advanced Certificate in Education. MELSON.

## CERAMIC ENGINEERING

*Professors:* A. I. ANDREWS (Head of Department), R. L. COOK, R. K. HURSH, F. V. TOOLEY.

*Assistant Professors:* A. W. ALLEN, E. D. LYNCH.

*Instructors:* R. J. MCEVOY, W. J. MEID.

*Assistant:* R. J. BEALS.

### Courses for Undergraduates

101. **Introduction to Ceramic Engineering.** Raw materials, classification and characteristics of ceramic products, and methods of manufacture. Recitations and laboratory. I; 3. Prerequisite: Sophomore standing in ceramic engineering. ALLEN, LYNCH.

102. **Ceramic Processes and Equipment.** Sources, preparation of materials, and manufacturing processes and control. Recitations and field trip. II; 3. Prerequisite: Sophomore standing in ceramic engineering. MCEVOY.

121. **Pottery and Ceramic Glazes.** A general introduction to ceramics and ceramic technique, particularly for students not in ceramic engineering. Recitation and laboratories. I, II; 3. LYNCH.

### Courses for Advanced Undergraduates

201. **Ceramic Technology.** Physical and chemical properties and reactions of ceramic materials and mixtures. Recitations and laboratories. I; 5. Prerequisite: Junior standing in ceramic engineering. COOK, MCEVOY.

202. **Ceramic Technology.** Continuation of Ceramic Engineering 201. Recitations and laboratories. II; 5. Prerequisite: Ceramic Engineering 201. COOK, LYNCH.

203. **Principles of Drying.** Drying, drying equipment, and construction and regulation of dryers. Recitations. I; 3. Prerequisite: Credit or registration in Ceramic Engineering 201. MEID.

204. **Kilns, Furnaces, and Firing Operations.** The firing process, utilization of fuels, types of kilns and furnaces and their operation. Recitations. II; 3. Prerequisite: Credit or registration in Ceramic Engineering 202. MEID.

211. **Ceramic Bodies and Glazes.** Materials, compositions, processing, properties, and tests. Recitations and laboratories. I; 5. Prerequisite: Ceramic Engineering 202. BEALS, COOK, LYNCH.

214. **Elementary Glass Technology.** Elementary consideration of the general constitution of glass, unit processes and operations in the preparation of glass, and data on the glass industry. Preparation of glasses of various compositions, and measurement of important glass properties. Lectures and laboratory. II; 3. Prerequisite: Junior standing in ceramic engineering, chemistry, or physics. TOOLEY.

215. **Cements, Limes, and Plasters.** Composition, reactions, methods of manufacture, and testing. Recitations. I; 2. Prerequisite: Ceramic Engineering 201 and 202. TOOLEY.

216. **Porcelain Enamels.** Compositions, preparation, application, properties, and tests. Recitations. II; 3. Prerequisite: Registration in Ceramic Engineering 202. COOK.

217. **Elementary Glass Technology.** Continuation of Ceramic Engineering 214. This course completes the study of unit processes and operations in the glass preparation process and introduces the student to the study of glass properties of importance in manufacture and end use. I; 2. Prerequisite: Ceramic Engineering 214. TOOLEY.

218. **Refractories.** Composition and properties of refractory materials and products, their manufacture and use. Recitations. II; 3. Prerequisite: Ceramic Engineering 202 and 204. ALLEN.

221. **Pyrometry.** Principles and methods used in high temperature measurement and introduction to process temperature control. Recitation and laboratory. I, II; 2. Prerequisite: Junior standing; sophomore physics. ALLEN, BEALS.

233. **Methods of Ceramic Microscopy.** Microscopic, photographic, and related optical methods of measurement applied to interpretation of pyrochemical reactions and control of raw materials and products of ceramic engineering. I, II; 3. Prerequisite: Geology 130; sophomore physics. ALLEN.

256. **Porcelain Enamel Laboratory.** Smelting milling application properties and tests. Laboratories. II; 2. Prerequisite: Credit or registration in Ceramic Engineering 216. BEALS, COOK, MCEVOY.

271. **Ceramic Engineering Design.** Design of ceramic dryers, kilns, and furnaces. Laboratories. I; 2. Prerequisite: Theoretical and Applied Mechanics 221; Ceramic Engineering 203 and 204. HURSH, MEID.

272. **Ceramic Engineering Design.** Design of special ceramic equipment, factory planning, and layout. Laboratories. II; 3. Prerequisite: Theoretical and Applied Mechanics 221; Ceramic Engineering 203, 204, and 271. HURSH, MEID.

295. **Research Methods.** Procedures and planning of investigations in ceramic research. I; 1. Prerequisite: Senior standing in ceramic engineering. TOOLEY.

297. **Thesis.** Research investigation in ceramics or ceramic engineering. I; 2. Prerequisite: Senior standing; credit or registration in Ceramic Engineering 295. ALLEN, ANDREWS, COOK, HURSH, LYNCH, TOOLEY.

298. **Thesis.** Research investigation in ceramics or ceramic engineering. II; 1 to 3. Prerequisite: Senior standing. ALLEN, ANDREWS, COOK, HURSH, LYNCH, TOOLEY.

299. **Inspection Trip.** Visits to industrial plants. I; no credit. Prerequisite: Senior standing. ALLEN, COOK, MEID.

# CHEMISTRY

## (Including Chemical Engineering)

*Professors:* R. Adams (Head of Department), L. F. Audrieth, J. C. Bailar, Jr., A. M. Buswell, H. E. Carter, G. L. Clark, E. W. Comings, D. T. Englis, R. C. Fuson, B. S. Hopkins (Emeritus), H. F. Johnstone, H. A. Laitinen, C. S. Marvel, T. E. Phipps, W. H. Rodebush, W. C. Rose, G. F. Smith, H. R. Snyder, F. G. Straub, S. Swann, Jr., F. T. Wall.

*Associate Professors:* H. G. Drickamer, R. B. Duffield, N. J. Leonard, G. T. Moeller.

*Assistant Professors:* T. Baron, Virginia Bartow, R. K. Finn, L. M. Henderson, D. R. Martin, L. E. Miller, B. R. Ray, C. S. Vestling, J. W. Westwater, P. E. Yankwich.

*Associate:* Rosalie M. Parr (Emerita).

*Instructors:* G. L. Bushey, E. J. Corey, L. F. Goodyear, H. S. Gutowsky, H. K. Inskip, C. E. Johnson, R. A. Johnson, S. W. Pelletier, M. Tamres.

*Assistants:* J. D. Batchelor, J. J. Beer, H. R. Beilfuss, C. H. Benton, J. W. Berry, E. P. Bertin, R. H. Bible, P. E. Bierstedt, S. J. Bodnar, D. B. Bright, V. E. Buhrke, J. P. Bullard, B. B. Burnett, D. W. Carley, L. A. Carpino, J V. Clarke, R. Cole, P. L. Cook, W. R. Cornman, R. B. Cuddeback, D. D. Darsow, E. E. Dekker, L. F. Dempsey, T. Dick, E. L. Dougherty, J. R. Dyer, M. J. Eitel, F. V. Fair, H. M. Foster, R. C. Fox, J. P. Freeman, J. Freiling, J. O. Gardner, R. Gher, J. Gillette, A. D. Gott, M. W. Grieb, E. W. Grieshaber, B. L. Haines, R. M. Heitmiller, R. J. Hellmann, A. W. Helwig, D. B. Hines, R. L. Hinman, H. O. House, E. T. Houvouras, L. Hsiao, M. A. Johnsen, R. O. Kerr, P. R. Kippur, T. J. Kneip, O. J. Koeppe, Ruth Koski, H. F. Kraemer, A. J. Kresge, J. R. Kuebler, W. F. J. Loranger, E. R. Lovejoy, D. W. McCall, F. McCollough, B. R. McGarvey, P. L. Martese, L. H. Meyer, C. Y. Meyers, T. G. Miller, K. C. Murdock, R. A. Osteryoung, F. L. Pundsack, R. E. Putnam, J. M. Quinn, Ella Richards, G. C. Robinson, W. G. Robinson, R. W. Roeske, A. M. Ross, R. W. Sanftner, R. L. Saxton, R. W. P. Short, H. J. Sims, S. G. Smith, W. E. Smith, A. A. Smucker, R. F. Sympson, I. R. Tannenbaum, N. W. Thomas, W. F. Ulrich, R. F. Vance, J. D. Vaughn, J. F. Walker, K. Wark, J. K. Williams, O. F. Williams, M. L. Winters, D. E. Woerner, O. York, W. A. Ziegler, P. A. Zimmerman.

### Requirements for L.A.S. Students

**Major:** Twenty hours in chemistry, excluding Chemistry 101, 102, 103, 104, 105, 106, 107, 108, and including courses in qualitative, quantitative, and organic chemistry. At least five hours must be taken from courses in the 300 group.

**Minors:** Twenty hours chosen from not more than two of the following: bacteriology, botany, ceramic engineering, entomology, geology, mathematics, philosophy, physics, physiology, psychology, and zoology. At least eight hours must be taken in each subject if two are chosen.

**Honors:** Students registered in Chemistry 290 or Chemical Engineering 290 automatically become candidates for honors. All other students in the chemistry or chemical engineering curriculum or majors in chemistry who have a 4.0 average or better are eligible to become candidates for honors, provided they signify their intentions in writing to their adviser, preferably at the time of registration in the first semester of their senior year, but not later than at time of registration for the second semester. This declaration of intention by the student shall be accompanied by registration in certain specific courses. Students in chemical engineering should select Chemical Engineering 381 or 379. Others should make a selection from one of the courses in the 300 group which will be indicated by the adviser as having been approved for this purpose by the department. The candidates will be required to supplement the regular work of the course with special assignments by the instructor. The final recommendation for honors will be based chiefly upon the previous record and the performance in the selected course.

## Sequence of Courses

Students in the curriculum of chemistry, majors in chemistry, and all others who desire a thorough training in the fundamentals of chemistry and their applications to modern life should select courses from the following, and usually in the sequence given: Chemistry 101 or 102, 106, 110, 124, 234, 336, 337, 240, 241, 342, 343, 350, and courses in the chemical engineering and miscellaneous groups. Students in the curriculum of chemical engineering who have had a thorough training in preparatory chemistry may be able to shorten the time spent in the foundational courses by taking the sequence Chemistry 107, 108, 124, 234, 336, 337, 240, 241, 342, and other advanced courses. Students in the College of Engineering (except ceramists, ceramic engineers, and those who desire to take Chemistry 240) should register in Chemistry 103 or 102, 104, 122.

Students who are compelled to meet chemical requirements briefly may register for the following sequence: Chemistry 101 or 102, 105, 122, 132 or 133. Students who find it impossible to take more than one semester's work are requested to register in Chemistry 101 or 102 in the second semester rather than in the first.

## Restrictions

Students of junior standing must have a 3.5 general average, exclusive of the basic courses in military training and the required work in physical education and hygiene, in order to register in the curriculum of chemistry or chemical engineering. With the exception of students in the College of Engineering and the College of Agriculture, registration of other students in chemistry courses except those of freshman and sophomore grade (namely, Chemistry 101, 102, 103, 104, 105, 106, 107, 108, 110, 122, 123, 124, 132, 133, 234) is restricted to those having a 3.5 general average exclusive of the basic courses in military training and the required work in physical education and hygiene or an average of at least 3.5 in chemistry courses. Transfer students to be admitted must have a corresponding record in the institution (or institutions) from which they transfer and must maintain a similar average at the University of Illinois. A student minoring in chemistry who can not meet the above requirements may be accepted in junior and senior chemistry courses, provided his adviser requests admission in writing and provided space is available.

# CHEMISTRY

## Courses for Undergraduates

**101. General Chemistry.** For students who have no entrance credit in high school chemistry. I, II; 5. Students who have used their high school chemistry for entrance credit and students with 95 or more credit hours receive only 3 hours credit. Prerequisite: One unit of high school physics, or 2½ units of high school mathematics, or credit in Mathematics 111 or 112. BUSHEY, JOHNSON, TAMRES.

**102. General Chemistry.** For students who have had one year of high school chemistry. I, II; 3. Students below the rank of senior receive 5 hours credit provided their high school chemistry has not been used for entrance credit and their final grade in Chemistry 102 is "C" or above. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: One unit of high school chemistry, or equivalent. BUSHEY, JOHNSON, TAMRES.

**103. General Chemistry.** Lectures, recitations, and laboratory. For engineering students who have had no chemistry. I, II; 4. Students who have used their high school chemistry for entrance credit and students with 95 or more credit hours receive only 3 hours credit. Prerequisite: One unit of high school physics, or 2½ units of high school mathematics, or credit in Mathematics 111 or 112. BUSHEY, JOHNSON, TAMRES.

**104. Chemistry of the Metallic Elements.** Lectures, recitations, and laboratory. Limited to students in engineering curricula. I, II; 4. Credit will not be granted to students who have received credit in Chemistry 105 or 106. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. TAMRES, AUDRIETH, JOHNSON.

**105. Inorganic Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students who are not eligible for Chemistry 104 or 106. I, II; 5. Credit in Chemistry 105 will not be granted to students who have received credit in Chemistry 104 or 106. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. BAILAR, BARTOW.

**106. Inorganic Chemistry.** Metallic elements. For students in curricula of chemistry, and ceramic engineering, and chemistry majors who are not premedical students. I, II; 5. Credit will not be granted to students who have received credit in Chemistry 104 or 105. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. MARTIN.

**107. General Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students in curricula of chemistry or chemical engineering. I; 5. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Excellent high school background in chemistry as shown by a placement examination. MOELLER.

**108. General Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students in curricula of chemistry or chemical engineering. II; 5. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 107. MOELLER.

**110. Qualitative Analysis.** Qualitative analysis of metals and inorganic compounds. Open to all students; required of those whose major is chemistry or chemical engineering and those registered in the curriculum of chemistry except students who qualify for Chemistry 107 and 108. I, II; 5. Prerequisite: Chemistry 106. MOELLER.

**122. Elementary Quantitative Analysis.** Gravimetric and volumetric analysis, stoichiometrical relations, practical applications. For all students in home economics and premedical courses and all others who have not followed the sequence Chemistry 101, 102 or 103, 106, and 110. I, II; 5. Prerequisite: Chemistry 104, 105, or 106. JOHNSON.

**123. Quantitative Analysis for Engineers.** A course in quantitative analysis designed for the needs of engineers, especially ceramic and metallurgical. I, II; 5. Prerequisite: Chemistry 104 or 105. JOHNSON, SMITH.

**124. Quantitative Analysis.** Gravimetric and volumetric analysis, modern advanced theory and practice. For all students other than those specified for Chemistry 122 and 123. I, II; 5. Prerequisite: Chemistry 110, or satisfactory record in Chemistry 107 and 108. ENGLIS, LAITINEN.

**132. Elementary Organic Chemistry.** Beginning course in organic chemistry especially for students in the College of Agriculture. I, II; 3. Prerequisite: Chemistry 101 or 102, or equivalent. PELLETIER.

**133. Elementary Organic Chemistry.** To fulfill the requirements for premedical, predental, preveterinary, dietetics, and home economics students. I, II; 5. Prerequisite: Chemistry 105 or 110. INSKIP.

## Courses for Advanced Undergraduates

**234. Organic Chemistry.** For students whose major is in chemistry, or for those registered in the curriculum of chemistry or chemical engineering. I, II; 5. Prerequisite: Chemistry 124. MARVEL.

**240. Elementary Physical Chemistry.** Lectures and problems. I, II; 3. Prerequisite: Chemistry 124; Physics 103 and 104, or equivalent; Mathematics 132 or 137. GUTOWSKY, RODEBUSH.

**241. Elementary Physical Chemistry.** Laboratory to accompany Chemistry 240. I, II; 1. Prerequisite: Chemistry 124; Physics 101 and 102, or 103 and 104; Mathematics 132, or 137 and 147. GUTOWSKY, YANKWICH.

245. **Elementary Physical Chemistry.** For students in engineering; not open to chemistry majors. I; 3. Prerequisite: Chemistry 122; Physics 101 and 102, or 103 and 104; Mathematics 132, or 137 and 147. YANKWICH.

246. **Elementary Physical Chemistry.** For students in engineering; not open to chemistry majors. II; 3. Prerequisite: Chemistry 245. YANKWICH.

247. **Elementary Physical Chemistry.** For premedical students only. I, II; 4. Prerequisite: Chemistry 122 and 133; Physics 102 or 104, or equivalent. RAY.

249. **Chemistry of Colloids.** Basic principles and applications. II; 3. Prerequisite: Chemistry 122 and 247, or equivalent. RAY.

290. **Thesis.** Limited in general to seniors in the curriculum of chemistry. All students taking this course must present a thesis in order to receive credit. Except under unusual circumstances, only those students registered in Chemistry 290 will be recommended for honors. I, II; 2 to 6. Prerequisite: Majors in chemistry in the general curriculum may register if they have completed a minimum of twenty-three hours of chemistry, which must include at least five hours from courses for advanced undergraduates. Other students must have the consent of the head of the department. Each student who desires research must obtain, before the time of registration, special written permission from the instructor under whom he is to work. ADAMS (in charge).

291. **Elements of Glass Blowing.** Demonstrations and practice in the elementary operations of glass blowing. The construction of Pyrex laboratory equipment. I, II; 1. Prerequisite: Junior standing in chemistry. GOODYEAR.

292. **Chemical Literature and Reference Work.** Required of juniors in chemistry; advised for students in the curriculum of chemical engineering; with the consent of the instructor, elective for majors in chemistry. I, II; 1. Prerequisite: Eighteen hours of chemistry; one year of French or German; junior standing. BARTOW.

294. **Chemical Literature and Reference Work.** For those who have had one semester of Chemistry 292. Required of juniors in chemistry; advised for students in the curriculum of chemical engineering. I, II; 1. Prerequisite: Chemistry 292. BARTOW.

## Courses for Advanced Undergraduates and Graduates

315. **Inorganic Chemistry.** Nuclear and extra-nuclear atomic structures and their relation to the properties of the elements and of their compounds; types of bonding; survey of the periodic relationships, preparation, and applications of the elements and their compounds. I, II; 3 hours, or ¾ unit. Prerequisite: Fifteen hours of credit in chemistry courses exclusive of courses numbered below 110. AUDRIETH.

316. **Inorganic Chemistry.** Preparation of typical inorganic compounds illustrating special and more advanced techniques. I, II; 2 hours, or ½ unit. Prerequisite: Credit or registration in Chemistry 315. MARTIN, MOELLER.

324. **Quantitative Inorganic Microanalysis and Chemical Statistics.** Lectures and discussions on modern micro and ultramicro apparatus, techniques, and applications; laboratory work on gravimetric and volumetric methods on the micro scale and on volumetric and photometric methods on the ultramicro scale; discussion of estimation and statistical treatment of errors; and applications of statistical methods to experimental design. II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 or 325; senior or graduate standing in chemistry. CLARK, JOHNSON.

325. **Analytical Chemistry.** A survey course for advanced undergraduate and graduate students requiring further training and review in analytical chemistry. II; 3 hours, or ¾ unit. Prerequisite: Advanced standing in chemistry. LAITINEN.

326. **Chemical Analysis and Treatment of Water.** Chemical and instrumental methods for analysis of water and determination of quality. Chemical principles and processes in water purification and conditioning. Relationship of chemistry of water

to municipal and industrial use. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 124. ENGLIS.

**327. Special and Instrumental Methods of Analysis.** Gas analysis; electrometric titration, optical methods, and other advanced analyses. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124, 234, 240, and 241. SMITH.

**328. Chemical Microscopy and Crystallography.** The theory and practice of the use of the optical microscope in chemical identification and analysis, and in the characterization and classification of crystals; principles of crystallization, crystal growth, polymorphism. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 and 240; consent of instructor. CLARK, JOHNSON.

**329. Food Analysis.** Quantitative organic analysis of food products; alcohols, carbohydrates, fats and oils, cereals, nitrogenous bodies, preservatives, and colors. II; 5 hours, or 1¼ units. Prerequisite: Chemistry 122 or 124, and 133 or 234. ENGLIS.

**336. Organic Chemistry.** Second course. Lectures and recitations. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 and 234. LEONARD, MARVEL.

**337. Organic Chemistry.** Laboratory experiments in organic chemistry. I, II; 2 hours, or ½ unit. Prerequisite: Chemistry 234 and 336. MILLER.

**338. Systematic Identification of Organic Compounds.** I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 336 and 337, or equivalent. LEONARD, SNYDER.

**342. Elementary Physical Chemistry.** Continuation of Chemistry 240. Lectures. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 240. GUTOWSKY, PHIPPS.

**343. Elementary Physical Chemistry.** Laboratory to accompany Chemistry 342. I, II; 1 hour, or ¼ unit. Prerequisite: Chemistry 240 and 241; credit or registration in Chemistry 342. GUTOWSKY, YANKWICH.

**344. Principles of Chemical Thermodynamics.** Thermodynamics and free energy calculations. I, II; 2 hours, or ¾ unit. Prerequisite: Chemistry 240 and 342, or consent of instructor. PHIPPS, RODEBUSH.

**345. Colloid and Surface Chemistry.** Physical chemistry for colloid systems; properties of surfaces and interfaces; applications. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 336 and 342, or consent of instructor. RAY.

**346. Atomic Structure and Valence.** Advanced physical chemistry. I or II; 2 hours, or ½ unit. Prerequisite: Chemistry 240 and 342. YANKWICH.

**349. Colloid and Surface Chemistry.** Laboratory. Quantitative experiments in colloid and surface chemistry. I, II; 1 hour, or ¼ unit. Prerequisite: Credit or registration in Chemistry 345, or consent of instructor. RAY.

**350. Biochemistry.** Chemistry of carbohydrates, lipids, and proteins; the alimentary processes, blood, tissues, and metabolism; quantitative analysis of gastric contents, blood, and urine. Clinical aspects for prospective students of medicine. Lectures, conferences, laboratory, and readings. I, II; 5 hours, or 1¼ units. Prerequisite: Chemistry 122 or 124, and 133 or 234. CARTER, HENDERSON, ROSE, VESTLING.

**351. Techniques of Blood Analysis and Their Applications.** II; 3 hours, or ¾ unit. Prerequisite: Chemistry 350. CARTER.

**352. Biochemistry of Vitamins and Hormones.** II; 3 hours, or ¾ unit. Prerequisite: Chemistry 350. CARTER.

**395. History of Science with Particular Reference to Chemistry.** I; 2 hours, or ¼ unit. Prerequisite: Junior standing with twenty hours of laboratory science. BARTOW.

**397. Radiochemistry.** Properties of radioactive nuclei, nature of radioactivity, nuclear reactions, detection equipment, and tracer technique. Lectures. I, II; 2 hours, or ½ unit. Prerequisite: Chemistry 240 and 241. DUFFIELD.

**398. Radiochemistry.** Laboratory to accompany Chemistry 397. I, II; 1 hour, or ¼ unit. Prerequisite: Chemistry 240 and 241; credit or registration in Chemistry 397; consent of instructor. DUFFIELD.

## CHEMICAL ENGINEERING

### Courses for Advanced Undergraduates

**261. Stoichiometry.** A course of lectures and problems on material balances and heat balances combined with an introduction to chemical engineering. I; 3. Prerequisite: Credit or registration in Chemistry 240, or 245 and 246. BARON.

**266. Inspection Trip.** Inspection of the manufacturing facilities of several chemical and fabrication plants. Duration of trip: three days each semester. I, II; ½. Prerequisite: Senior standing in chemistry or chemical engineering; consent of instructor. WESTWATER.

**267. Measurements and Instrumentation.** Methods and instruments used for the control of industrial chemical processes. Conferences, laboratory, and readings. I; 2. Prerequisite: Junior standing; Physics 101 and 102, or 103 and 104. WESTWATER.

**290. Thesis.** Limited in general to seniors in the curriculum in chemical engineering. Others must have the consent of the head of the department. All students taking this course must present a thesis in order to receive credit. I, II; 2 to 6. ADAMS (in charge).

### Courses for Advanced Undergraduates and Graduates

**363. Unit Operations in Food Technology.** Same as Food Technology 363. Fundamentals of heat transfer, fluid flow, extraction, drying, and other unit operations especially adapted to the food and biochemical industries. Primarily for students in chemistry and food technology; not open to majors in chemical engineering. Lectures and problems. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 240 or 247 and one year of calculus. FINN.

**370. Chemical Engineering Thermodynamics.** The fundamental concepts and laws of thermodynamics. Primarily for students in chemical engineering. II; 3 hours, or ½ unit. Prerequisite: Chemical Engineering 261; Chemistry 240. COMINGS, DRICKAMER.

**371. Principles of Chemical Engineering.** Scientific principles in unit operations of chemical engineering. Lectures, problems, and quizzes. I, II; 4 hours, or 1 unit. Prerequisite: Chemical Engineering 370, or consent of instructor. BARON.

**372. Unit Operations Laboratory.** First course. To accompany Chemical Engineering 371. I, II; 2 hours, or ¼ unit. Prerequisite: Credit or registration in Chemical Engineering 371. WESTWATER.

**373. Principles of Chemical Engineering.** Scientific principles in unit operations of chemical engineering. Lectures, problems, and quizzes. I, II; 4 hours, or 1 unit. Prerequisite: Chemical Engineering 371; Chemistry 240. DRICKAMER.

**374. Unit Operations Laboratory.** Second course. To accompany Chemical Engineering 373. I, II; 2 hours, or ¼ unit. Prerequisite: Credit or registration in Chemical Engineering 373. BARON, WESTWATER.

**377. Chemical Engineering Technology.** Study of industrial chemical processes and principles. II; 3 hours, or ½ unit. Prerequisite: Chemistry 240. WESTWATER.

**379. Chemical Engineering Projects.** Laboratory. Development of an individual project. I, II; 2 hours, or ½ unit. Prerequisite: Senior standing in chemistry or chemical engineering. JOHNSTONE.

**380. Chemical Engineering Calculations.** Numerical and graphical methods for problems in equilibria and kinetics. Lectures and recitations. II; 3 hours, or ¾ unit. Prerequisite: Chemistry 344; Chemical Engineering 371. BARON.

**381. Chemical Engineering Plant Design.** Comprehensive problems. I, II; 3 hours, or ½ unit. Prerequisite: Chemical Engineering 373. FINN.

**382. High Pressure Reactions.** Lectures, recitations, and problems. II; 2 hours, or ½ unit. Prerequisite: Chemistry 234 and 344. COMINGS.

383. **Applied Electrochemistry.** Use of electric current through solutions for carrying out reactions. Lectures. I; 2 hours, or ½ unit. Prerequisite: Chemistry 234, 336, and 342. SWANN.

384. **Power Plant and Boiler Water Problems.** I; 2 hours, or ½ unit. Prerequisite: Senior standing in chemical engineering. STRAUB.

385. **Bioengineering.** Study of the chemical processes and principles used in the production of foodstuffs, pharmaceuticals, and fine chemicals. Primarily for students in chemical engineering. May be substituted for Chemical Engineering 377 and 374 in the chemical engineering curriculum. Lectures and laboratory. Laboratory may be omitted by graduate students. I; 5 hours, or 1 to 1¼ units. Prerequisite: Credit or registration in Chemical Engineering 373. FINN.

386. **Bioengineering.** Principles of chemical engineering applied to the fermentation and allied industries. May be used as an advanced elective and as a substitute for Chemical Engineering 379 in the chemical engineering curriculum. Lectures and laboratory. II; 5 hours, or 1 to 1¼ units. Prerequisite: Bacteriology 320, Chemistry 234 and 240, or consent of instructor. FINN.

387. **Flow of Fluids.** Advanced course. Lectures, recitations, and problems. I; 2 hours, or ¾ unit. Prerequisite: Chemical Engineering 371, or equivalent with consent of instructor. COMINGS.

388. **Heat Transmission.** Advanced course. Lectures, recitations, and problems. I; 2 hours, or ¾ unit. Prerequisite: Chemical Engineering 371, or equivalent with consent of instructor. COMINGS.

## CIVIL ENGINEERING

*Professors:* W. C. HUNTINGTON (Head of Department), H. E. BABBITT, J. G. CLARK, J. S. CRANDELL (Emeritus), E. DANNER, G. H. DELL, J. J. DOLAND, E. E. KING (Emeritus), N. M. NEWMARK, W. A. OLIVER, R. B. PECK, W. H. RAYNER, T. C. SHEDD, J. VAWTER, C. C. WILEY, W. M. WILSON (Emeritus).

*Associate Professors:* E. E. BAUER, J. C. DIETZ, W. W. HAY, F. A. REICKERT, M. O. SCHMIDT, C. P. SIESS.

*Assistant Professors:* C. P. ATKINS, W. J. AUSTIN, E. R. BRETSCHER, E. J. DAILY, C. S. DANNER, D. A. DAY, L. E. GOODMAN, J. C. GUILLOU, W. S. POLLARD, T. H. THORNBURN.

*Associate:* H. O. IRELAND.

*Lecturer:* K. TERZAGHI.

*Instructors:* J. W. BRISCOE (on leave), H. H. CONNOLLY, N. KHACHATURIAN, C. H. KOONTZ, J. R. LEEK, H. S. SUNDIN, G. A. YOUNG.

### Courses for Undergraduates

101. **Surveying Theory.** Theoretical aspects of plane and topographic surveying; land surveying; computation of areas and volumes. S (first three weeks); 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. DELL, RAYNER, SCHMIDT, and others.

102. **Surveying Practice.** Field practice of plane and topographic surveying. The use of the level, transit, and tape in making engineering surveys and topographic maps. Given in Summer Surveying Camp. S; 4. Prerequisite: Civil Engineering 101. DELL, RAYNER, SCHMIDT, and others.

103. **Route Surveying.** Principles of the economic location of railways and highways; horizontal and vertical alinement for route projects; computations for earthwork quantities and distribution; railway track turnouts. I, II; 3. Prerequisite: Credit in Summer Surveying Camp. C. S. DANNER, HAY, RAYNER.

111. **Plane Surveying.** Use and care of instruments; practice in the common methods of measuring distance, angles, and elevation; computation of areas and volumes; land

surveying procedure and legal principles. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. RAYNER.

112. **Topographical Surveying.** Contours, map construction, and volumetric estimates from contour maps, astronomical determination of latitude and azimuth; transit stadia methods of topographic surveying; survey and map of an assigned area. I, II; 3. Prerequisite: Civil Engineering 111. SCHMIDT.

115. **General Surveying.** Use and care of surveying instruments; methods of making engineering surveys; computations of areas and volumes; contour problems; transit stadia mapping methods. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. C. S. DANNER, KOONTZ, YOUNG.

117. **Surveying for Landscape Architects.** Use and care of surveying instruments; methods of making engineering surveys; computations of areas and volumes. I; 3. Prerequisite: Sophomore standing in landscape architecture. C. S. DANNER.

118. **Surveying for Landscape Architects.** Transit stadia methods for topographic surveys; topographic mapping with the transit and the plane table. II; 3. Prerequisite: Civil Engineering 117. C. S. DANNER.

140. **Engineering in Public Health.** Administration, design, and construction in water supplies; sewerage; domestic, municipal, and industrial wastes; atmospheric pollution; housing, food, camp, emergency, and general sanitation. II; 3. Prerequisite: Sophomore standing. BABBITT, DIETZ.

160. **Building Construction and Materials.** Materials, types of building construction and details. I, II; 3. Prerequisite: Sophomore standing. ATKINS.

## Courses for Advaned Undergraduates

203. **Route Surveying.** Principles of the economic location of railways and highways; horizontal and vertical alinement of route projects, including circular and spiralled curves; computations for earthwork quantities and distribution; railway track turnouts. I, II; 4. Prerequisite: Civil Engineering 112, 115, or 118. KOONTZ, RAYNER, YOUNG.

206. **Photogrammetry.** Principles of perspective and stereoscopic vision; characteristics of aircraft and cameras for mapping work; photographic scales and displaced images; plotting map control from photographers by slotted templets; transferring photographic data by tracing and by projectors; drawing a topographic map from photographs using (a) a linear scale and (b) the stereocomparagraph, the multiplex projector, and other photogrammetric instruments. I; 3. Prerequisite: Civil Engineering 112, or equivalent. RAYNER.

219. **Construction Surveying.** Principles of precise measurements and adjustments of observations as applied to the construction of bridges, buildings, tunnels, sewers, etc. II; 3. Prerequisite: Civil Engineering 103 or 203; Mathematics 132; junior standing. RAYNER.

220. **Highways.** Materials of construction for roads and pavements; drainage and earthworks; earth, gravel, macadam, bituminous, and concrete roads; city and rural pavement construction, repairs and maintenance; accessories; width and capacity of roads and streets; highway financing; highway operation. I, II; 3. Prerequisite: Credit or registration in Civil Engineering 230. C. S. DANNER, E. DANNER, LEEK, POLLARD, WILEY.

222. **Highway and Municipal Design.** Road systems, city streets, pavement types; design, preparation of plans, specifications, and estimates of cost. I, II; 4. Prerequisite: Civil Engineering 220, or consent of instructor. POLLARD.

223. **Traffic Engineering.** The vehicle and driver; traffic surveys for volume, movement, speed, purpose, origin, destination, etc.; accident causes, reports, and analysis; signs, signals, and markings; parking. Field problems. I, II; 3. Prerequisite: Civil Engineering 220, or consent of instructor. LEEK, WILEY.

224. **Airport Design.** Requirements of site; arrangement of various facilities; location, soil studies, grading, drainage, and surfacing of runways; general features of hangars,

shops, and other buildings. II; 3. Prerequisite: Senior standing in engineering or architecture. REICKERT.

225. **Railroad Construction and Maintenance.** Earthwork and rockwork; roadbed construction; tunnel work; drainage; track materials; track stresses; track design. II; 3. Prerequisite: Civil Engineering 103 or 203, or consent of instructor. HAY.

226. **Railway Location and Operation.** Influences of traffic, alinement, and gradient upon operating expenses. I; 3. Prerequisite: Civil Engineering 103 or 203; senior standing, or consent of instructor. HAY.

227. **Terminals.** Design and operation of railway yards, freight terminals, and passenger stations; bus and truck terminals and stations. I; 2. Prerequisite: Civil Engineering 103 or 203; senior standing, or consent of instructor. HAY.

229. **Signals.** Railway route and block signaling; automatic train control; interlocking; track circuits; signal equipment. Highway fixed signal and traffic actuated signals. II; 2. Prerequisite: Civil Engineering 103 or 203. HAY.

230. **Soils and Bituminous Materials.** Production, types, standard specifications, and important properties of asphalt and tar. Identification, classification, and physical properties of earth materials; character of natural soil deposits and techniques of sub-surface exploration. Laboratory practice in testing of soil, asphalt, and tar. I, II; 2. Prerequisite: Junior standing in engineering or architecture. BAUER, POLLARD, THORNBURN.

231. **Advanced Highway Materials.** Advanced work in the examination and testing of bituminous materials and mixtures, Portland cement concrete, and soils for engineering purposes. Each student selects one material for special study. I; 2. Prerequisite: Civil Engineering 235, 230, or 332. BAUER.

235. **Plain Concrete.** Production, properties, specification, requirements and uses of Portland cement, aggregates, mixing water, and admixtures; proportioning; field practice in the production of concrete; laboratory practice including tests on materials and concrete of various proportions; calculations and graphs based on values from concrete proportioning projects. I, II; 2. Prerequisite: Junior standing in engineering, architecture, or landscape architecture. BAUER, KOONTZ, POLLARD, YOUNG.

237. **Estimates and Costs.** Economic selection; construction cost estimating; direct and overhead costs; cost keeping; construction by force account and contract; time schedules and progress charts; valuations. I, II; 2. Prerequisite: Senior standing in engineering or architecture. ATKINS.

238. **Construction Equipment and Methods.** Types of construction equipment; uses, limitations, and proper selection; production capacities; ownership and operating costs. I, II; 3. Prerequisite: Senior standing in engineering or architecture. E. DANNER.

239. **Construction Planning and Management.** Construction organization, economics, and finances; requirements for equipment, materials, and personnel; plant layouts; progress schedules; concrete forms; false work; cofferdams; control of operations. II; 4. Prerequisite: Civil Engineering 237 and 238. DAY.

240. **Water Supply.** Finances, hydraulics, demands, sources, reservoirs, pipe lines, pumping machinery, materials, distribution systems. I, II; 4. Prerequisite: Theoretical and Applied Mechanics 221, 232, and 234; Mechanical Engineering 201. BABBITT, CONNOLLY, DIETZ, SUNDIN.

241. **Sewerage.** Sewerage systems, surveys and plans, hydraulics, house sewerage, rainfall and storm-water flow, size and capacity of sewers, appurtenances, estimates and specifications, construction. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 232 and 234. BABBITT, CONNOLLY, DIETZ, SUNDIN.

248. **Water Supply and Sewerage.** Development, design, construction, and maintenance of municipal water works and sewerage works not including water purification or sewage treatment. I, II; 4. Prerequisite: Theoretical and Applied Mechanics 232 and 234. CONNOLLY, SUNDIN.

250. **Hydrology.** Precipitation, evaporation, transpiration, deep seepage, runoff, hydraulics of rivers and small streams; use of current meter, float, weir, etc. I; 3. Prerequisite: Senior standing. DOLAND, SCHMIDT, YOUNG.

252. **Water Resources, Planning and Development.** Purposes and techniques of planning water resources development; methods of evaluating the engineering and economic aspects of water conservation projects developed through the examination of actual proposals. I; 3. Prerequisite: Credit or registration in Civil Engineering 250. DOLAND.

255. **Water Power Engineering.** Rainfall and stream flow records; estimate of available power; theory and testing of turbines, dams, power houses, approach channels, draft tubes, relation of investment costs, auxiliary plants, and other factors related to the value of projects. II; 3. Prerequisite: Theoretical and Applied Mechanics 232 and 234; Civil Engineering 250. DOLAND, YOUNG.

260. **Structural Engineering.** Design of steel, reinforced concrete, and timber structures. For students in other departments. Civil engineers receive no credit in this course. I; 3. Prerequisite: Senior standing in engineering or architecture. BRETSCHER.

261. **Structural Analysis.** Analysis of stresses in statically determinate structures. I, II; 4. Prerequisite: Credit or registration in Theoretical and Applied Mechanics 221. BRETSCHER, BRISCOE, DAILY, DAY.

262. **Structural Analysis.** An introduction to statically indeterminate structures. I, II; 3. Prerequisite: Civil Engineering 261. BRETSCHER, BRISCOE, DAILY, DAY, KHACHATURIAN, SUNDIN.

263. **Elementary Structural Design.** An introduction to structural design; design of flexural members in steel, concrete, and timber. I, II; 2. Prerequisite: Theoretical and Applied Mechanics 221; credit or registration in Civil Engineering 261. BRETSCHER, DAILY, DAY, KHACHATURIAN.

264. **Structural Design.** Theory of design, and design of structures of steel, concrete, and timber as applied to industrial buildings and short or medium span highway truss bridges. I, II; 5. Prerequisite: Civil Engineering 262 and 263. BRETSCHER, DELL, REICKERT.

265. **Structural Design.** Continuation of Civil Engineering 264. Devoted principally to bridges. I, II; 4. Prerequisite: Civil Engineering 264. OLIVER.

270. **Foundations and Retaining Walls.** Evaluation of subsoil conditions; choice of type and basis for design of foundations; earth pressures and retaining wall design. I, II; 3. Prerequisite: Civil Engineering 261 and 263. DAILY, IRELAND.

271. **Earth and Masonry Structures.** Analysis and design of masonry dams, earth dams and embankments, and substructure for bridges and buildings. I, II; 2. Prerequisite: Credit or registration in Civil Engineering 270. DAILY.

290. **Contracts and Specifications.** Engineering relations; the law of contracts; business and technical clauses used in specifications. I, II; 2. Prerequisite: Senior standing in engineering or architecture. E. DANNER, HAY.

291. **Thesis.** Investigation or design. May be substituted for certain technical subjects in any of the six options of the senior year. I; 1 to 3. Prerequisite: Senior standing; consent of head of department.

292. **Thesis.** Continuation of Civil Engineering 291. Investigation or design. May be substituted for certain technical subjects in any of the six options of the senior year. II; 1 to 3. Prerequisite: Senior standing; consent of head of department.

293. **Special Problems.** Individual investigations or studies of any phase of civil engineering selected by the student and approved by the department. I; 1 to 3. Prerequisite: Senior standing.

294. **Special Problems.** Individual investigations or studies of any phase of civil engineering selected by the student and approved by the department. II; 1 to 3. Prerequisite: Senior standing.

295. **Professional Practice.** A series of lectures by distinguished engineers on all phases of civil engineering. Lectures will be given about once every two weeks. I; no credit. Prerequisite: Junior standing.

296. **Professional Practice.** A series of lectures by distinguished engineers on all phases of civil engineering. Lectures will be given about once every two weeks. II; no credit. Prerequisite: Junior standing.

299. **Inspection Trip.** I; no credit. Prerequisite: Senior standing.

### Courses for Advanced Undergraduates and Graduates

332. **Engineering Properties of Soils.** Laboratory practice in the testing, classification, and identification of soils; engineering soil surveys and explorations; and sampling. I, II; 2 hours, or ½ unit. Prerequisite: Senior standing in engineering, or consent of instructor. BAUER.

344. **Water and Sewage Treatment.** Principles, design, and operation of water purification and sewage treatment works. I; 5 hours, or 1 unit. Prerequisite: Credit or registration in Bacteriology 104 and Civil Engineering 240 or 241. BABBITT, DIETZ.

345. **Public Health Engineering.** Principles of sanitation, waste collections, and disposal; sanitary regulations; biostatistics. II; 3 hours, or ½ unit. Prerequisite: Credit or registration in Bacteriology 104 and Chemistry 122. BABBITT.

351. **Drainage and Flood Control.** Land drainage, river improvement, flood control. II; 3 hours, or ½ unit. Prerequisite: Civil Engineering 250. DOLAND.

356. **Hydraulic Engineering Laboratory.** Fundamental principles, operation, and use of model laboratories, dimensional analysis, hydraulic similitude, theory and design of hydraulic models. II; 3 hours, or ¾ unit. Prerequisite: Theoretical and Applied Mechanics 232 and 234. GUILLOU.

359. **River Hydraulics.** Gaging of streams, stream erosion and deposition, use of groins, revetments and mats, stream systems, and river navigation. I; 3 hours, or ¾ unit. Prerequisite: Theoretical and Applied Mechanics 232. DOLAND.

361. **Statically Indeterminate Structures.** Elastic theory and its applications to statically indeterminate structures. I, II; 3 hours, or ½ unit. Prerequisite: Civil Engineering 262; credit or registration in Civil Engineering 264. CLARK, OLIVER.

362. **Statically Indeterminate Structures.** Continuation of Civil Engineering 361. I, II; 3 hours, or ½ unit. Prerequisite: Civil Engineering 361, or 262 and consent of instructor. CLARK, VAWTER.

373. **Introduction to Soil Mechanics.** Investigation of engineering characteristics of subsurface conditions; principal theories of soil mechanics; application to design of retaining walls, open cuts, drainage systems, and stability of slopes. I; 4 hours, or 1 unit. Prerequisite: Credit or registration in Civil Engineering 270, or consent of instructor. PECK.

374. **Applied Soil Mechanics.** Application of soil mechanics to foundations of buildings, compaction of embankments, and construction of culverts and tunnels. II; 4 hours, or 1 unit. Prerequisite: Credit or registration in Civil Engineering 270, or consent of instructor. PECK.

375. **Engineering Aspects of Surficial Soils.** Use of geologic, pedologic, and airphoto information for identification and evaluation of the engineering properties of surficial soils. II; 4 hours, or 1 unit. Prerequisite: Civil Engineering 230, or consent of instructor. THORNBURN.

## CLASSICS

### (Including Greek and Latin)

*Professors:* J. L. HELLER (Head of Department), B. E. PERRY, A. TURYN.
*Associate Professor:* R. P. OLIVER.
*Assistant Professor:* L. D. JOHNSTON.
*Instructor:* F. D. LAZENBY.
*Assistants:* D. L. COVEY, E. M. HAMSON, J. F. KIRBY.

### Major in Greek

**Major:** Twenty hours, excluding Greek 150, 180, and 318.

**Minors:** Twenty hours chosen from not more than two of the following: foreign language (Latin being especially recommended), English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

### Major in Latin

**Major:** Twenty hours, excluding Latin 101, 102, 103, and 162, and including six hours in translation courses for advanced undergraduates and graduates. In addition to these twenty hours in the language, students whose major is Latin and who plan to teach the subject are also required to take Classics 101, Latin 162, and a three-hour course in the history of the Roman Republic (see History 383).

**Minors:** Twenty hours chosen from not more than two of the following: foreign language (Greek being especially recommended), English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

### Major in the Classics

**Major:** Twenty hours in Greek and Latin, excluding Greek 150, 180, 318, Latin 101, 102, 103, and 162. At least six hours must be taken in the secondary language, and the remaining hours in the primary language.

**Minors:** Twenty hours chosen from not more than two of the following: foreign language, English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

## CLASSICS IN TRANSLATION

### Courses for Undergraduates

NOTE: The following courses presuppose no knowledge of the Greek or Latin language and are open to all students. They are not to be counted toward a major in Greek, Latin, or the Classics. Other courses in the department requiring no knowledge of Greek or Latin are Greek 150, 180, 318, and Latin 162.

**101. Mythology of Greece and Rome.** Lectures and readings. This course is acceptable toward the general education requirement in the College of Liberal Arts and Sciences. I; 2. LAZENBY.

**103. Introduction to Greek Literature in English Translation.** This course is acceptable toward the general education requirement in the College of Liberal Arts and Sciences. I; 3. PERRY.

**106. Introduction to Latin Literature in English Translation.** This course is acceptable toward the general education requirement in the College of Liberal Arts and Sciences. II; 3. HELLER.

**110. Greek Drama in English Translation.** This course is acceptable toward the general education requirement in the College of Liberal Arts and Sciences. II; 2. LAZENBY.

## GREEK

### Courses for Undergraduates

**101. Elementary Greek.** An introduction to the fundamentals of classical Greek including the reading of simple prose. I; 4. LAZENBY.

**102. Elementary Greek.** Continuation of Greek 101. Grammar and reading. II; 4. Prerequisite: Greek 101, or equivalent. LAZENBY.

**150. Greek and Roman Sports.** Illustrated lectures and readings. Knowledge of Greek is not required. I, II; 2. JOHNSTON.

180. **Elements of Technical Terminology.** Presentation in vivid English contexts, and analysis of Greek and Latin prefixes, suffixes, and root words basic in the vocabularies of modern science, especially botany, psychology, zoology, and medicine. I, II; 2. Prerequisite: Sophomore standing. Knowledge of Greek or Latin is not required. HELLER.

### Courses for Advanced Undergraduates

201. **Second Year Greek.** Reading of narrative prose. I; 3. Prerequisite: Greek 102, or equivalent. COVEY.

202. **Second Year Greek.** Continuation of Greek 201. Introduction to epic Greek; reading of Homer. II; 3. Prerequisite: Greek 201, or equivalent. COVEY.

### Courses for Advanced Undergraduates and Graduates

301. **Herodotus and the Lyric Poets.** I; 3 hours, or ½ unit. Prerequisite: Greek 202, or equivalent. Offered in 1952-1953 and in alternate years. TURYN.

302. **Thucydides and Plato.** II; 3 hours, or ½ unit. Prerequisite: Greek 301, or 303, or equivalent. Offered in 1952-1953 and in alternate years. TURYN.

303. **Greek Drama.** I; 3 hours, or ½ unit. Prerequisite: Greek 202, or equivalent. Offered in 1951-1952 and in alternate years. LAZENBY.

304. **Oratory and Aristotle.** II; 3 hours, or ½ unit. Prerequisite: Greek 301, or 303, or equivalent. Offered in 1951-1952 and in alternate years. LAZENBY.

318. **Classical Archaeology.** A survey of the art, public and private antiquities, and monuments of the ancient world. I; 2 hours, or ½ unit. Knowledge of Greek or Latin is not required. LAZENBY.

## LATIN

### Courses for Undergraduates

101. **Elementary Latin.** Grammar and reading. For students who have had no work in Latin. I; 4. Students with 95 or more credit hours receive only 3 hours credit. HAMSON, HELLER.

102. **Elementary Latin.** Continuation of Latin 101. Grammar and reading of elementary prose. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Latin 101, or one year of high school Latin. HAMSON.

103. **Intermediate Latin.** Review of grammar; reading of easy narrative prose. I, II; 4. Prerequisite: Latin 102, or two years of high school Latin. Students with three years of high school Latin may also register for this course. HAMSON, HELLER, JOHNSTON.

104. **Intermediate Latin.** Continuation of Latin 103. Reading of narrative prose with an introduction to verse. I, II; 4. Prerequisite: Latin 103, or three or four years of high school Latin. JOHNSTON, KIRBY.

113. **Latin Composition.** Grammatical drill and practice in simpler forms of expression. Required of those receiving the recommendation of the department as teachers. I; 2. Prerequisite: Credit or registration in Latin 103, or three years of high school Latin. JOHNSTON.

114. **Latin Composition.** Continuation of Latin 113. Required of those receiving the recommendation of the department as teachers. II; 2. Prerequisite: Latin 113. JOHNSTON.

162. **Roman Private Life.** Social organization, marriage, education, amusements. Illustrated lectures and readings. II; 1. Prerequisite: Sophomore standing. JOHNSTON.

### Courses for Advanced Undergraduates

201. **Survey of Latin Literature.** The Republican Period. I; 3. Prerequisite: Latin 104, or four years of high school Latin. JOHNSTON.

202. **Survey of Latin Literature.** Continuation of Latin 201. The Imperial Period. II; 3. Prerequisite: Latin 104, or four years of high school Latin. KIRBY.

291. **Honors Course.** Thesis or a special course of study approved by the department. I; 2. Prerequisite: Senior standing; fourteen hours of Latin acceptable for a major. OLIVER.

292. **Honors Course.** Thesis or a special course of study approved by the department. II; 2. Prerequisite: Senior standing; fourteen hours of Latin acceptable for a major. OLIVER.

### Courses for Advanced Undergraduates and Graduates

301. **Livy and Tacitus.** I; 3 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. Offered in 1951-1952 and in alternate years. OLIVER.

302. **Horace.** Reading of both odes and satires. II; 3 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. Offered in 1951-1952 and in alternate years. OLIVER.

303. **Cicero.** Essays, philosophical works, and orations. I; 3 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. Offered in 1952-1953 and in alternate years. OLIVER.

304. **Vergil.** Epic and eclogue. II; 3 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. Offered in 1952-1953 and in alternate years. LAZENBY.

311. **Advanced Latin Composition.** Practice in the writing of Latin prose. Required of those receiving the recommendation of the department as teachers. I; 2 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. TURYN.

312. **Advanced Latin Composition.** Practice in the writing of Latin prose. II; 2 hours, or ½ unit. Prerequisite: Latin 311. TURYN.

## DAIRY SCIENCE

*Professors:* G. W. SALISBURY (Head of Department), R. W. BARTLETT, W. B. NEVENS, M. J. PRUCHA (Emeritus), C. S. RHODE, H. A. RUEHE, W. W. YAPP.

*Associate Professors:* J. G. CASH, K. E. GARDNER, R. G. HANSEN.

*Assistant Professors:* M. H. ALEXANDER, K. E. HARSHBARGER, R. L. HAYS, K. A. KENDALL, S. D. MUSGRAVE, W. O. NELSON, E. E. ORMISTON, P. P. SOMERS, R. W. TOUCHBERRY, N. L. VANDEMARK, W. A. WOOD.

*Associate:* S. G. MENEFEE (on leave).

*Instructor:* L. R. FRYMAN.

*Assistants:* F. N. BAKER, P. C. BURK, E. M. CRAINE, DOROTHY J. DILLON, W. M. DILLON, JR., L. E. GAGE, O. H. HORTON, S. C. HOWERTER, R. KOVACHEVICH, M. PURKO, K. A. TABLER, A. VAN TIENHOVEN, C. J. WILSON.

### Courses for Undergraduates

100. **Introduction to Dairy Production.** Survey of industry; breeds of dairy cattle; selection, feeding, and management of herds. Lecture, quiz, and laboratory. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. ALEXANDER, GARDNER, HARSHBARGER, KENDALL.

104. **Dairy Cattle Judging.** Selection and judging. Lectures, recitations, and laboratory. I, II; 2. Prerequisite: Dairy Science 100, or consent of instructor. ORMISTON.

110. **Plant and Animal Genetics.** Same as Agronomy 110, Animal Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104.

150. **General Dairy Bacteriology.** Relationship of bacteriology to milk and milk products; milk inspection; dairy farm and milk plant sanitation. II; 2. Prerequisite: Bacteriology 104; sophomore standing. NELSON.

151. **General Dairy Bacteriology.** Determination of numbers and types of bacteria in milk; milk fermentations. II; 3. Prerequisite: Bacteriology 104; credit or registration in Dairy Science 150. NELSON.

180. **Chemical Control Methods for Dairy Plants.** Lectures, recitations, problems, and laboratory. II; 3. Prerequisite: Chemistry 101. HANSEN.

## Courses for Advanced Undergraduates

201. **Reproduction, Genetics, and Improvement of Dairy Cattle.** A foundation course in the physiology and endocrinology of reproduction, the inheritance of physical and production characteristics of dairy cattle, and a consideration of dairy cattle improvement. I; 3. Prerequisite: Dairy Science 100. MUSGRAVE, SALISBURY.

202. **Feeding Dairy Cattle.** Feeding of dairy cattle. Lectures, laboratories, tours, and problems. II; 3. Prerequisite: Dairy Science 100. GARDNER.

204. **Dairy Production.** Special ten-week course for students specializing in the teaching of vocational agriculture. II; 2. Prerequisite: Dairy Science 100. KENDALL, YAPP.

## Courses for Advanced Undergraduates and Graduates

311. **Problems in Dairy Farming.** Dairy farm operation, including field and building arrangement, cropping systems, herd management, sanitary milk production, and farm marketing problems. Lectures, quiz, assigned readings, and problems. I; 3 hours, or ¾ unit. Prerequisite: Dairy Science 100 and 202. YAPP.

320. **Special Problems.** I, II; 5 hours, or 1 unit. Prerequisite: Senior standing; approval of head of department. GARDNER, HANSEN, HAYS, NELSON, NEVENS, SALISBURY, VANDEMARK, WOOD, YAPP.

330. **Reproduction and Artificial Insemination of Farm Animals.** The anatomy and physiology of reproduction in farm animals, the principles of artificial insemination, and the factors affecting conception in natural and artificial breeding. I; 3 hours, or ¾ unit. Prerequisite: Zoology 104 and either Dairy Science 100 or Animal Science 101. VANDEMARK.

334. **Marketing Dairy Products.** Same as Agricultural Economics 334 and Marketing 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

350. **Advanced Dairy Bacteriology.** Bacteriology of dairy products, normal and abnormal. I; 4 hours, or 1 unit. Prerequisite: Bacteriology 104; Chemistry 132, or equivalent. NELSON, WOOD.

380. **Composition of Dairy Products.** I; 3 hours, or ¾ unit. Prerequisite: Chemistry 132. HANSEN.

## DAIRY TECHNOLOGY

(See Food Technology)

## DANCE

(See Physical Education)

# DIVISION OF GENERAL STUDIES

*Professors:* R. G. Bone (Director of Division), R. H. Baker, M. T. Herrick, H. R. Wanless.

*Associate Professors:* H. L. Andrews, W. Habberton, J. E. Hulett, L. S. Hultzén, O. E. Kugler, J. M. McCrimmon, W. E. Morrell.

*Assistant Professors:* F. Costin, H. E. Gulley, O. E. Kugler.

*Instructors:* J. F. Glawe, F. H. Jackson, A. Tress Lundman, O. R. Rankin.

*Assistants:* E. P. Bloom, R. T. Calef, D. Garrett, J. P. Kingston, W. J. Mahoney, J. T. Mohan, F. D. Parker, C. A. Poxon.

## Courses for Undergraduates

111. **Verbal Communication.** Writing, reading, speaking, and listening; study of theory and practice. I; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Passing grade in Rhetoric 101 placement examination, or passing grade in Rhetoric 100. This course meets the requirements for Rhetoric 101. Bloom, Gulley, Hultzén, Kingston, Lundman, McCrimmon (Chairman).

112. **Verbal Communication.** A continuation of Division of General Studies 111. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 111. This course meets the requirements for Rhetoric 102. Bloom, Gulley, Hultzén, Kingston, Lundman, McCrimmon (Chairman).

121. **History of Civilization.** Survey of the social, economic, political, cultural, and intellectual life of the western world from the earliest times to the end of the seventeenth century. I; 4. Students with 95 or more credit hours receive only 3 hours credit. Habberton (Chairman), Jackson, Parker.

122. **History of Civilization.** A continuation of Division of General Studies 121, studying the period from the last quarter of the seventeenth century to the present day. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Habberton (Chairman), Jackson, Parker.

131. **Biological Science.** Introduction to the biological sciences, their aims, content, and methods, with special reference to their application to human life and civilization. I; 4. Students with 95 or more credit hours receive only 3 hours credit. Andrews, Calef, Garrett, Glawe, Kugler (Chairman), Mahoney.

132. **Biological Science.** A continuation of Division of General Studies 131. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 131 or consent of instructor. Andrews, Calef, Garrett, Glawe, Kugler (Chairman), Mahoney.

141. **Physical Science.** A study of the fundamental principles in the fields of astronomy, chemistry, geology, and physics; the importance of these principles in a scientific age and their influence on modern life. I; 4. Students with 95 or more credit hours receive only 3 hours credit. Baker, Morrell (Chairman), Poxon, Rankin, Wanless.

142. **Physical Science.** A continuation of Division of General Studies 141. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 141. Baker, Morrell (Chairman), Poxon, Rankin, Wanless.

151. **Social Science.** Major social groupings, relations, and institutions in contemporary civilization; fundamental resources of society; social and economic institutions. I; 4. Prerequisite: Sophomore standing, or consent of instructor. Hulett (Chairman), Mohan.

152. **Social Science.** National and international political institutions; social change and its consequences; dominant contemporary issues; the role of the educated individual in the modern world. II; 4. Prerequisite: Division of General Studies 151 or equivalent, or consent of instructor. Hulett (Chairman), Mohan.

161. **Literature and Fine Arts.** Introduction to the general principles of art by analysis of selected work of literature, music, painting, sculpture, and architecture. I; 4. Prerequisite: Sophomore standing. Herrick.

**162. Literature and Fine Arts.** A continuation of Division of General Studies 161. II; 4. Prerequisite: Division of General Studies 161. HERRICK.

**171. General Division Psychology.** A description and explanation of the psychological principles of everyday living, with emphasis on how our behavior is motivated, how we learn, intelligent behavior, and personality; consideration of the application of psychology to various social issues. This course plus a course in philosophy meets the psychology-philosophy sequence requirement. I, II; 4. Prerequisite: Sophomore standing. COSTIN.

# ECONOMICS

*Professors:* E. E. HAGEN (Chairman of Department), H. K. ALLEN, V L. BASSIE, J. F. BELL, E. L. BOGART (Emeritus), H. R. BOWEN, DOROTHY S. BRADY, P. H. BROWN, W. E. CHALMERS, H. M. GRAY, C. A. HICKMAN, L. HURWICZ, D. L. KEMMERER, F. E. LEE (on leave), S. LITMAN (Emeritus), D. P. LOCKLIN, E. B. MCNATT, W. H. MCPHERSON, W. A. NEISWANGER, R. M. NOLEN, MARGARET G. REID, D. W. SMYTHE, C. M. THOMPSON (Emeritus), P. M. VAN ARSDELL, E. T. WEILER.

*Associate Professors:* J. F. DUE, D. P. FLANDERS, R. W. HARBESON, F. B. HAWORTH, G. KLEINER, R. W. MAYER, J. L. MCCONNELL, R. I. MEHR, F. MODIGLIANI, R. C. OSBORN, D. W. PADEN, J. B. PARRISH, W. C. ROBB, G. A. STEINER.

*Assistant Professors:* GRACE BECKETT, E. C. BUDD, R. CAMPBELL, J. A. COCHRAN, R. FERBER, R. GIBSON, HARRIET D. HUDSON, R. H. MCEVOY, P. N. VUKASIN, JANET L. WESTON.

*Associate:* D. H. HOOVER (Emeritus).

*Instructors:* E. T. CAMMACK, H. A. CUTLER, R. EISNER, D. B. SMITH.

*Assistants:* J. W. BEALL, R. BRUMBERG, H. C. BUNKE, ESTHER DUVALL, E. L. ECKLES, R. A. HEDGES, J. E. HOWELL, B. J. MARKS, D. A. NEUMANN, M. O. NEWMAN, R. D. PASHEK, H. R. POWELL, J. T. WOODWARD, S. T. WORLAND.

## Requirements for L.A.S. Students

**Major:** In addition to Economics 102 and 103, or Economics 108 and 109, twenty hours of courses in economics for which Economics 102 or 108 is a prerequisite, including Economics 200 and two other courses chosen from the following: Economics 210, 214, 216, 218, 224, 226, 228, 238, 239, 240, 246, 248, 250, 251, 254, 257, 260, 262, 272, 280, 288, 290, 291, 292, 293, 306, 312, 315, 328, 336, 342, 378, 379, 380, 384, 390, 391. The prerequisite of Economics 102 or 108 is waived for Economics 336.

Liberal Arts and Science majors in economics are advised strongly to elect Economics 171 and Accountancy 201. Economics 171 is acceptable toward the twenty-four major but Accountancy 201 is not acceptable toward the major requirement.

**Minors:** Twenty hours in any one or two of the following subjects: geography, geology, history, mathematics, philosophy, political science, psychology, social welfare administration, sociology and anthropology. At least eight hours must be taken in each subject, if two are chosen. The curriculum on international affairs will be accepted as a minor and also the program in Latin American studies.

## Courses for Undergraduates

NOTE: Economics 100 is open only to freshmen, without previous requirements. Economics 102 and 103, or Economics 108 and 109, are the fundamental courses in economics. Economics 102 and 103 are required of all Commerce students, and these, or Economics 108 and 109, are required of all Liberal Arts majors in economics. Students who expect to do advanced work in economics should take these courses in their sophomore year.

Economics 108, though open to all students who have had one year of university work, is primarily for students in the Colleges of Agriculture and Engineering and in curricula in home economics, chemistry, and other sciences.

Advanced courses in economics may be grouped in several rather distinct classifications in which students may find it profitable to concentrate in their third and fourth years. The following are suggested: economic theory, history, and statistics; public and private finance, including insurance; labor; foreign trade; public utilities and transportation.

**100. Introduction to Business.** An introductory course on the principles and practices of our economic system from the point of view of the business manager. Open to freshmen only. I, II; 3. WESTON and others.

**102. Principles of Economics.** Principles of production, supply, demand, value, price, distribution. I, II; 3. Prerequisite: One year of college work. WEILER and others.

**103. Principles of Economics.** Principles of economics as applied to exchange, money, banking, price changes, governmental finance, etc. I, II; 3. Prerequisite: Economics 102. WEILER and others.

**108. Elements of Economics.** A brief presentation of price determination, international trade and exchange, money and banking, and public finance. For non-commerce students only. I, II; 3. Prerequisite: One year of college work. WEILER and others.

**109. Principles of Economics.** A continuation of the introductory course in economics for non-commerce students. This course, together with Economics 108 constitutes a two-semester sequence in elementary economics. For non-commerce students only. I, II; 3. Prerequisite: Economics 108.

**136. Economic History of the United States.** Main events and leading personalities in the economic development of the United States as seen in the westward movement, the growth of industry, agriculture, commerce, finance, transportation, the trust movement, and labor from 1790 to the present. I, II; 3. KEMMERER and others.

**138. Introduction to the Economic History of Modern Europe.** The evolution of the economic institutions of modern Europe in relation to the development of industry, commerce, transportation, and finance in the principal European nations. I, II; 3. CAMPBELL.

**170. Elements of Statistics.** Methods of collection—presentation and interpretation of quantitative economic data, averages, dispersion, index numbers, reliability of statistics, time series analysis, and simple correlation. Commerce students are required to register in Economics 170; they will not receive credit for Psychology 135 or Mathematics 161. I, II; 3. Prerequisite: Economics 102 or 108; sophomore standing. NEISWANGER and others.

**171. Applied General Statistics.** An introduction to elementary statistical methods as applied in the social sciences. The following topics will be considered: scientific method, quantitative measurement in the social sciences, analysis of frequency distribution, sampling, measuring relationship between two variables, analysis of time series, and uses of statistics in government, industry, and in the social sciences. I, II; 3. Prerequisite: Sophomore standing. PADEN.

## Courses for Advanced Undergraduates

**210. Comparative Economic Systems.** The economics of capitalism, socialism, communism, and fascism. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. MCCONNELL.

**214. Public Finance and Taxation.** Economic principles as they apply to public expenditures, public revenues, public borrowing, and administration of public funds. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. ALLEN, DUE.

**216. State and Local Taxation in Illinois.** State and local revenues; tax administration; state aid; state-administered locally shared taxes; state control of local taxes and finances; governmental accounting, auditing, budgeting, and reporting; purchasing; and debt administration. I; 3. Prerequisite: Economics 102 and 103, or junior standing. ALLEN.

218. **Current Economic Problems (National and International).** A survey of important economic problems such as money and banking, methods of finance, labor, transportation, and international trade. For non-commerce students only. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. GRAY.

224. **World Markets.** Chief markets of the world, with special reference to the United States; materials of commerce. II; 3. Prerequisite: economics 102 and 103, or 108; junior standing. BECKETT.

228. **International Finance.** The United State balance of international payments and world supply of and demand for dollars; foreign exchange, exchange controls; United States international investments; exporting and importing; financial shipments. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. KLEINER.

238. **Economic Development of Modern Europe I.** Evolution of the major elements in economic life: agricultural, extractive, and manufacturing industries; transportation, marketing, and finance. How the European experiences gave rise both to orthodox and divergent economics; economic history as expressing dynamic economics. Early modern economic origins in England and France from 1500 to the present. 1; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. VUKASIN.

239. **Economic Development of Modern Europe II.** Evolution of the major elements in economic life: agricultural, extractive, and manufacturing industries; transportation, marketing, and finance. How the European experiences gave rise both to orthodox and divergent economics; economic history as expressing dynamic economics. Germany, Russia, Italy, Spain, and Ireland. II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. VUKASIN.

240. **Labor Problems.** A survey of the nature and causes of the problems of the American wage earner: economic insecurity, wages, hours, substandard workers; and the efforts of wage earners and society through organization and legislation to solve these problems. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. MCNATT and others.

246. **Economics of Trade Unionism.** Economic problems and issues involved in trade union organization and operation in this country and abroad, with emphasis on public policy. I; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. PARRISH.

248. **Personnel Administration.** A study of employer-employee relationships: job analysis; recruitment, selection, training, transfer, promotion, and dismissal of employees; industrial unrest; working hours; wage plans and policies; employee health, interest, and morale; employee stabilization; collective bargaining and recent legislation; personnel services and administration in the public service. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. ROBB and others.

250. **Money, Credit, and Banking.** A study of the monetary and banking systems. The Federal Reserve System, price fluctuation, foreign exchange financing, and specialized financial institutions in the United States. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. NOLEN and others.

252. **Banking Practice in the United States.** A study of the functions, operations, policies, organization, management, and supervision of banks. II; 3. Prerequisite: Economics 250 and 254. NOLEN.

253. **Investment Banking.** Role of investment banking in the financial organization; investment banking houses; relation of investment banking to other financial institutions; regulation of investment banking and the security markets; current problems and developments in investment banking. II; 3. Prerequisite: Economics 250 and 254. MAYER.

254. **Corporation Finance and Management.** Nature of corporation finance and its relation to economics, accounting, and law; legal nature and organization of corporation; capital, capitalization, and financial plan; financial analysis and interpretation; initial financing; refinancing; working capital; income administration, including dividend policies; expansion; corporate financial relationships, internal and external. I, II; 3. Prerequisite: Economics 102 and 103, or 108; Accountancy 105 or 201; junior standing. VAN ARSDELL and others.

255. **Industrial Consolidation.** The development of industrial concentration; the financing of complex corporate enterprises; the problems of the independent, competitive business enterprise; the development of public policy relating to monopoly, industrial cooperation, and competition. I, II; 3. Prerequisite: Economics 254. BROWN.

257. **Corporation Finance.** A study of the character of corporations; corporate securities; acquiring capital; internal financial control; expansion and intercorporate relations; and corporate capital readjustments. For non-commerce students only. I, II; 3. Prerequisite: Economics 102 and 103, or 108. OSBORN.

258. **Financial Institutions—Functions and Practices.** A study of the development and the practices of specialized financial institutions in the United States, commercial banking, central banking, savings banks, trust companies, investment banking, real estate finance, agricultural finance, government financial institutions. I; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. NOLEN.

259. **Investments.** Nature of investment policy; types, analysis, and evaluation of investment opportunities; investment procedure. I, II; 3. Prerequisite: Economics 254; senior standing. MAYER.

260. **Economics of Insurance.** A survey course in the field of insurance to serve as a common introductory course to the fire, marine, casualty, surety, and life branches of the insurance business. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. MEHR and others.

262. **Life Insurance.** A study of the life insurance industry, companies, products, and markets. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. CAMMACK and others.

263. **Property Insurance.** The study of hazards, policies, rates, underwriting, and loss-adjustment problems connected with fire insurance, extended coverage, consequential property damage, ocean marine and inland marine losses. II; 3. Prerequisite: Economics 260. HEDGES.

271. **Business Statistics.** Analysis of business data through use of statistical methods. Normal curve and sampling, variance analysis, special purpose index numbers, curvilinear trend analysis, multiple and partial correlation, with reference to specific business problems. I, II; 3. Prerequisite: Economics 103 and 170. HAWORTH.

272. **Business Fluctuations and Forecasting.** Analysis of the types of variation in individual industry series and the economy as a whole; use of various indicators of economic conditions. II; 3. Prerequisite: Economics 170 and 250. PADEN.

280. **Economics of Public Utilities.** Economic characteristics of utilities industries; special problems of production, utilization, price, finance, management, control, regulation; public and cooperative ownership; federal power policy. II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. GRAY.

287. **Industrial Traffic Management.** A course designed especially for those who will come into contact with transportation as shippers or receivers of freight. Includes use of freight classifications, tariff interpretation, rights and duties of shippers and carriers. II; 3. Prerequisite: Economics 384. LOCKLIN.

288. **Government Regulation of Economic Activity.** Analysis of the economic bases, policies, and consequences of government regulation over economic activity. Economic patterns of regulation are studied in selected areas. I, II; 3. Prerequisite: Economics 102 and 103, or 108; junior standing. STEINER.

290. **Honors.** Senior candidates for graduation with honors or high honors should elect one or the other of the following options: Option A—an acceptable thesis in economics. Option B—a comprehensive examination, six hours in length, covering a review of economics. I; 2 to 4. BROWN.

291. **Honors.** Senior candidates for graduation with honors or high honors should elect one or the other of the following options: Option A—an acceptable thesis in economics. Option B—a comprehensive examination, six hours in length, covering a review of economics. II; 2 to 4. BROWN.

292. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may

do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. BROWN.

293. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. II; 3 to 5. BROWN.

## Courses for Advanced Undergraduates and Graduates

300. **Intermediate Economic Theory and Analysis.** A development of the leading theories and analyses of value and distribution. Problems and policies of price determination of both the firm and the industry and factor pricing are presented at the intermediate level of analysis. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102, 103 or 108, 109. BELL.

301. **Monetary and Employment Theory.** Monetary theory including various versions of the quantity theory of money; the modern theory of the determination of the level of income and employment; theories of money and interest; fiscal and monetary policy; criteria, proposals, critique. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 250.

306. **History of Economic Thought.** A study of the development of economics. Contributions of schools of thought and individual writers are examined as they influenced economic thought and national policy. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; senior standing. BELL.

312. **Economics of Welfare.** An analysis and summary of the consequences for human welfare of economic security, political and economic freedom, consumption standards, community of enterprise, ratio of population to resources, unemployment, inequality of distribution, human costs in production, etc. Utilitarianism, Germanic theories of the state, and other systems of thought relating to welfare will be examined. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108. MCCONNELL.

315. **Problems in Federal Taxation.** An intensive study of the present federal tax system, with particular reference to inequities and effects of the taxes upon the economy; alternative measures of reform. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. DUE.

326. **Theories and Policies of International Commerce.** Analysis of international trade theories, classical and recent; international commercial policies, past and current; economic development in selected world regions; international commercial agreements and conferences; foreign trade policy of the United States. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108 and 109. BECKETT.

328. **Latin American Economic Problems.** Economic problems of commerce, finance, transportation, mining, agriculture, and industry in Latin America; Latin American and international economic relationships. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. BECKETT.

336. **American Economic History.** Westward movement: growth of industry, agriculture, commerce, finance, transportation, trust movement, and labor. Not open to students who took Economics 336 as freshmen. I, II; 3 hours, or ½ to 1 unit. KEMMERER.

342. **Economics of Social Security.** Same as Labor and Industrial Relations 342. A critical analysis of the economic issues and problems involved in our legislative efforts to reduce the economic risks of unemployment, old age dependency, and industrial injury. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. MCNATT.

343. **The Labor Market.** Same as Labor and Industrial Relations 343. Economic analysis of the labor market, its structure, characteristics, and operations in contrast with other markets; factors making for equilibrium and disequilibrium; migration; occupational and industrial mobility; labor market research including techniques and

materials. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108, and 240. PARRISH.

344. **The Law and Labor.** Same as Labor and Industrial Relations 344. An economic analysis of the problems and issues arising out of the legislative and judicial efforts to define the rights, duties, and responsibilities of labor organizations and management in the field of industrial relations. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; Economics 240. MCNATT.

346. **Foreign Labor Movements.** Same as Labor and Industrial Relations 346. Analysis of the history, organization, economic policies, political programs, and domestic, international, and contemporary influence of the labor movements of Great Britain, Sweden, Germany, France, Latin America, and Russia. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 240.

363. **Advanced Life Insurance.** A study of the application of life insurance to the problems of family security, business security, investments, and estate protection. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 262. MEHR.

366. **Casualty Insurance.** An examination of hazards, contracts, forms, rates, underwriting principles, and loss prevention activities in the following branches of insurance: workmen's compensation, automobile, public liability, burglary, robbery, theft, glass, power plant, credit, accident and health, and fidelity and surety. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 260. MEHR.

367. **Problems in Insurance.** An analysis of problems dealing with the fitting of insurance coverages to the needs of business. The course considers the problems of surveying hazards, selecting policy forms, rating, underwriting, loss adjustment, loss prevention, and over-all insurance planning. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 263 and 366; senior standing. MEHR.

371. **Applied Problems in Sampling.** Design of various types of samples useful in economic and business research; cost limitations and the design of samples; sources of bias and sampling methods; interpretation of the results. I, II; 3 hours, or ½ to 1 unit. Prerequisite: One course in mathematics; Economics 170 or a similar introductory course in statistics.

372. **Index Numbers.** The theoretical formulation of index numbers and the statistical problems of estimation and measurement for index numbers of price, production, productivity, cost of living, level of living, and preference scales. II; 2 hours, or ½ unit. Prerequisite: Economics 170; Economics 102 and 103, or 108.

373. **Correlations in Business and Economic Data.** A study of the measurement of relationships among economic and business data. Methods for expressing these relationships (correlation, analysis of variance, chi-square) will be studied by examining specific problems in which these techniques have proved to be useful. The use of critical attitudes in the use of statistical tools will be emphasized throughout the course. II; 2 hours, or ½ unit. Prerequisite: Economics 170, 171, or 271, or equivalent. PADEN.

375. **The National Income and Its Distribution.** The statistical aspects of estimating the national income and its distribution and of analyzing the interrelationships in national income and related series. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; a first course in statistics.

376. **Statistics of Labor.** A study of the methods and problems involved in the derivation of "labor statistics" from both the theoretical and practical points of view. The statistical aspects of the measurement, analysis, and interpretation of data on wages, employment, labor force, and productivity will be stressed. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 170 or equivalent.

377. **Senior Seminar in Statistics.** The work in the course will deal with statistical problems of general interest in economics and business. The topics will be selected to emphasize difficulties of definition, concept, data collection, measurement, and analysis and will serve to bring together the theoretical concepts and methodological tools which have been acquired by the student in preparatory courses. II;

3 hours, or ½ to 1 unit. Prerequisite: Economics 170 and 271; credit or registration in Economics 371 (or 372 and 373). NEISWANGER and others.

**378. Consumers and the Market.** Market forces affecting the quantity, quality, and price of consumer goods and consumers' ability to choose wisely, with special attention to retailing, monopolistic competition, advertising, the provision of information to consumer and important controls relating to these. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. REID.

**380. Economic Problems of the Family.** Economic functions and problems of the family, important changes, household production, earning the family income, its adequacy and security, the family standard of living, spending and saving, and problems of financial management. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. REID.

**384. Economics of Transportation.** Economic aspects of the transportation industry with special emphasis on problems of regulation and public policy. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. HARBESON, LOCKLIN.

**385. Economic Problems of Commercial Air Transport.** Study of air transport with particular reference to questions of public policy, system of regulation, and regulatory policy. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. LOCKLIN.

**386. Current Transportation Problems.** An analytical and critical study of selected problems of current interest in transportation. II; 3. Prerequisite: Economics 384. HARBESON.

**388. Economics of National Security.** Analysis of economic aspects of American national security in relation to world problems, economic problems of mobilization, and the impact of national security policies on the economy. Includes problems and policies in the area of industrial production, economic stabilization, manpower allocation, agriculture, foreign economic warfare, military procurement, and facility expansion. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108.

**389. Public Policy Relating to Competition and Monopoly.** The organization and tactics of market control, the development of antitrust law and policy, public policy regarding competitive practices, special policies applying to natural resource industries, and regulated monopoly and government ownership as alternatives to the antitrust approach. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. HARBESON.

**390. Economics of Communications I.** Same as Journalism 390. Economic problems associated with the public means of communication: telephone, telegraph, the postal service, the various forms of radio broadcasting including FM, television, and facsimile, and the use of radio for the safety and efficiency of transportation, protective services, etc. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

**391. Economics of Communications II.** Same as Journalism 391. Economic problems associated with the following means of communication: motion pictures, newspapers, magazines, and books. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

# EDUCATION

## (Including Agricultural Education and Industrial Education)

*Professors:* W. B. SPALDING (Dean of the College of Education), K. D. BENNE, T. E. BENNER, G. M. BLAIR, R. B. BROWNE, R. W. BURNETT, A. W. CLEVENGER, F. G. CORNELL, L. J. CRONBACH, J. J. DEBOER, G. P. DEYOE, A. F. DODGE (Emeritus), E. W. DOLCH, F. H. FINCH, C. R. GRIFFITH, H. M. HAM-

LIN, H. C. HAND, W. V. KAULFERS, S. A. KIRK, A. B. MAYS, W. S. MONROE (Emeritus), P. V. MILLER, C. W. ODELL, E. F. POTTHOFF, E. H. REEDER, C. W. SANFORD, J. H. SHORES, R. H. SIMPSON, B. O. SMITH, D. W. SNADER, W. VAN TIL, LETITIA WALSH, O. F. WEBER.

*Associate Professors:* C. M. ALLEN, A. W. ANDERSON, L. B. FISHER, W. E. HARNISH, J. T. HASTINGS, K. B. HENDERSON, M. K. HUMBLE, M. R. KARNES, C. G. KNAPP, LIESETTE J. MCHARRY, W. P. MCLURE, A. W. NOLAN (Emeritus), M. M. OHLSEN, H. A. SCHULTZ, CELIA B. STENDLER, M. R. SUMPTION, H. D. TRIMBLE, L. J. TRUMP, VELMA K. WILSON, H. S. ZIM.

*Assistant Professors:* G. F. ANDERSON, D. P. AUSUBEL, F. P. BARNES, W. W. CHARTERS, R. N. EVANS, G. C. FINLAY, N. L. GAGE, MABLE R. HAGAN, C. R. HILL, M. HORWITZ, G. O. JOHNSON, NELL JOHNSTON (Emerita), R. S. JONES, G. C. KETTELKAMP, W. KUHN, FLORENCE M. LAWSON (Emerita), W. M. LIFTON, W. E. MARTIN, F. MCMURRAY, L. E. METCALF, L. J. PHIPPS, R. E. PINGRY, G. W. REAGAN, ANNA B. ROBINSON, MARJORIE J. SCHAEVE, W. O. STANLEY, J. N. WEISS.

*Associate:* H. H. BRAUCHER (Emeritus).

*Instructors:* CATHERINE D. ADAMS, G. Z. BARNETT, HAZEL BOTHWELL, MARJORIE BROWN, MARGARETE CANTRALL, PAULINE E. CHANGNON, SUSAN CRAIN, DOROTHY L. DEMERS, N. E. DILLEY, R. P. FRAZIER, C. W. FROTHINGHAM, E. L. GAIER, J. W. HANSON, K. L. HUSBANDS, D. J. INABNIT, C. E. JOHNSON, E. JOHNSON, GLADYS L. JONES, F. KEAGLE, COLLEEN J. KIRK, D. R. KRATHWOHL, A. H. KREBS, A. M. LASHBROOK, I. LAZAR, M. LEWENSTEIN, AUDREY H. LINDSEY, J. E. MCCLELLAN, R. MILLER, MILDRED J. MOORE, BETTY J. OWEN, L. V. PETERSON, R. E. POTTER, ELSIE ROERTGEN, W. H. SCHUETZ, R. E. SCHULTZ, M. J. SCOTT, R. F. SEAMAN, ELIZABETH J. SIMPSON, W. R. SLOTHOWER, C. R. STAFFORD, L. WALTER, D. WARD, E. WEIR, W. L. WINNETT, WILMA WOHLER, N. YOUNG, METTA ZAHORSKY.

*Assistants:* C. H. BAUMGARDNER, M. BEBERMAN, C. A. BESEMAN, J. J. BLINDT, R. R. BRODA, E. S. BROWN, R. K. BROWN, C. BURLESON, OPAL W. BURLESON, K. W. DICKMAN, DORA DAMRIN, L. M. DUNN, J. P. DYKE, MARY E. EHART, R. ERDMAN, R. V. EXLINE, E. FOREMAN, MURIEL H. FRIEDMAN, SHIN GOO, G. R. GREDLER, G. V. GUY, RUBY MAE HOLDEN, R. H. HOLTZMAN, W. A. JENKINS, R. P. KROPP, J. L. LANDES, J. J. LASKA, D. S. LEEDS, M. LIEBERMAN, C. M. LINDVALL, W. D. MCNEILL, B. MEHL, ELIZABETH MITCHELL, R. B. MUDGE, M. C. OELKE, J. C. PAYNE, O. E. PITTENGER, C. D. PLATTE, M. A. POOLE, T. POROWSKI, T. B. PORTER, D. M. PRINCE, MERIAM ROSEN, J. L. SAUPE, H. SCHIFF, G. G. SHAFER, J. H. SLOSS, SICILY ANN SMEDSVIK, L. J. SMITH, E. C. SWADLEY, R. M. TOMLINSON, R. F. TONIGAN, E. WAHL, W. G. WARRINGTON.

## Courses for Undergraduates

**101. Nature of the Teaching Profession: An Orientation Course.** This course is designed to help the student get answers to the questions: "What does education in its various branches have to offer?" and "What preparation in general education, subject matter fields, and professional education is required or desirable?" Through an extensive testing and counseling program this course is designed to help the student evaluate his potentialities and problems with reference to becoming a teacher. I, II; 2. FINLAY, HAND.

## Courses for Advanced Undergraduates

**201. Foundations of American Education.** A study of contemporary American public education in the setting of current American culture. Confusions and issues with respect to the school program, its purposes, its content, its methods, and its organization are related to confusions and issues with respect to social, economic, and political purposes and organizations, both domestic and international. An attempt is made through the study of these relationships to clarify the contemporary social functions of the American school and teaching profession. I, II; 2. Prerequisite: Psychology 100; Education 101; registration in Education 230 or 240. SMITH, STANLEY.

211. **Educational Psychology.** The basic undergraduate course in psychology of education for prospective teachers. Materials and principles from the various areas of psychology (mental hygiene, psychology of learning, etc.) are applied to the practical problems of teaching. I, II; 3. Prerequisite: Psychology 100. BLAIR, CRAIN, CRONBACH, DOLCH, GAGE, JONES, MARTIN, SIMPSON.

218. **Remedial Reading in the Elementary School.** I; 3. Prerequisite: Education 211, DOLCH.

219. **Remedial Reading in the High School.** II; 3. Prerequisite: Education 211. DOLCH.

220. **Educational Practice in the Education of Exceptional Children.** A course in practice teaching providing teaching experience with exceptional children. I, II; 2 to 5. Prerequisite: Senior standing; consent of department; sufficient hours of background courses. JOHNSON, KIRK, and others.

230. **Principles of Elementary Education.** Application of general considerations of the role of American public education in current American culture to elementary education. Attention is given to basic principles underlying the selection of aims, content, programs, and methods for elementary schools. I, II; 2. Prerequisite: Education 101; registration in Education 201. BARNES, SHORES, LAZAR.

231. **Technic of Teaching in the Elementary School.** I, II; 3. Prerequisite: Education 100, 109, and 230; registration in Education 220 or 232. BARNES, SHORES.

232. **Educational Practice in Elementary Education.** A course in practice teaching to meet certification requirements for teaching in the elementary school. I, II; 2 to 5. Prerequisite: Education 230; senior standing. BARNES, HUSBANDS, JOHNSON.

233. **Development of Teaching Units in the Elementary School.** Techniques for the development of teaching units as a method of improvement of instruction in the elementary school. I, II; 2. ZIM.

234. **Science in the Elementary School.** The role of science in the elementary school and in the lives of children. Experiences, techniques, and organization of science content in primary, intermediate, and upper grades. No science background is assumed and no attempt is made to cover content. Opportunity for laboratory and field experiences and demonstrations of materials of value in science teaching. I, II; 3. ZIM.

235. **Teaching Social Studies in the Elementary School.** A course to help prospective elementary teachers to develop concepts with reference to the function of the elementary school in the development of social ideas and ideals with children. Special consideration is given to the social studies as the core of the elementary school curriculum. I, II; 3. Prerequisite: Education 101; junior standing. REEDER.

236. **Child Development for Elementary Teachers.** A study of child growth and development designed particularly for those preparing to teach in the elementary school. Special emphasis given to the significance of the developmental process for educational programs and procedures. Systematic experience in studying and evaluating children's behavior and in handling children. I, II; 3. Prerequisite: Psychology 100. LAZAR, MARTIN.

237. **Child Development for Elementary Teachers.** Continuation of Education 236. I, II; 3. Prerequisite: Education 236. LAZAR, MARTIN.

240. **Principles of Secondary Education.** Designed to provide each specialized educational worker with a common orientation as to the major responsibilities of the public school as a unit and his own specialized responsibilities and problems within the framework of the total educational enterprise. Sections in this course will, insofar as possible, be organized according to the student's teaching major. I, II; 2. Prerequisite: Psychology 100; Education 101; registration in Education 201. BURNETT, DEBOER, FINLAY, HAND, HENDERSON, KAULFERS, SNADER, VAN TIL.

241. **Technic of Teaching in the Secondary School.** Methods of instruction. I, II; 3. Prerequisite: Education 240; registration in Education 242. STAFF.

242. **Educational Practice in Secondary Education.** A course in practice teaching to meet certification requirements for teaching in secondary schools. Application for a practice teaching assignment must be made in March of the year prior to the academic

year assignment is desired. I, II; 2 to 5. Prerequisite: Education 240; senior standing. STAFF.

247. **Teaching of Speech. Same as Speech 247.** A study of methods and materials used in teaching speech in the high school. I, II; 5. Prerequisite: Senior standing; 3.5 grade average. MUELLER.

291. **Thesis.** I; 2. Prerequisite: Senior standing. SPALDING and others.

292. **Thesis.** II; 2. Prerequisite: Senior standing. SPALDING and others.

## Courses for Graduates and Advanced Undergraduates

300. **The History of Education.** Brief, introductory summary of ancient and medieval education followed by a more extended study of educational developments since the Italian Renaissance. Special emphasis placed on the relation of educational trends to broader social, economic, political, and intellectual movements. I, II; 3 hours, or ½ unit. ANDERSON.

301. **Philosophy of Education.** Based on a careful and critical reading of selected chapters from John Dewey's *Democracy and Education*. Designed to develop competencies in (1) locating and criticizing basic assumptions of an educational argument, (2) examining and criticizing basic assumptions about educational purposes and practices, and (3) examining and testing systematic relationships between educational ideas and assumptions, etc. I, II; 2 hours, or ½ unit. BENNE, MCMURRAY, SMITH, STANLEY.

302. **History of American Education.** The development of theory and practice in American education in relation to political, social, and cultural developments. I, II; 2 hours, or ½ unit. ANDERSON.

303. **Comparative Education.** General foundations course designed to contribute to professional competence in dealing with those educational problems requiring an understanding of the relationship of education to a particular society. A study of selected national systems of education in their differing cultural settings. I, II; 2 hours, or ½ unit. KAULFERS.

304. **Social Foundations of Education.** An introductory survey of the interrelationship between school and society and of the impact on public education of the major social trends and forces operating in our society. Designed to develop competencies in (1) understanding of the role of the culture in shaping both human personality and social institutions, (2) evaluating the effects of the various welfare and class levels in the United States on the lives of children and adults and on the work of the school, and (3) understanding major elements operating in the social crisis of our time and the impact of these elements on education. I, II; 2 hours, or ½ unit. BENNE, STANLEY.

311. **Psychology of Learning for Teachers.** A consideration of learning situations in the light of psychological findings and concepts. Development of a theory of learning, and its application to the teaching of attitudes, skills, and understandings. I, II; 2 hours, or ½ unit. Prerequisite: Education 211, and practice teaching or teaching experience. BLAIR, CRONBACH, JONES, POTTHOFF, SIMPSON, WOODMAN.

312. **Mental Hygiene and the School.** A consideration of social and emotional adjustment. Study of normal personality, integration, feelings of inferiority, adjustment mechanisms, classroom therapy, behavior disorders in children, and introduction to methods of child study and provision for emotionally disturbed children. I, II; 2 hours, or ½ unit. Prerequisite: Education 211, and practice teaching or teaching experience. AUSUBEL, BLAIR, HORWITZ, JONES, POTTHOFF, SIMPSON.

315. **Sociology of Education.** Same as Sociology 315. Objective comparative study of education as a social process in various cultures and historical periods, with main emphasis on present education in countries which share Western civilization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100. SHIDELER.

317. **Exceptional Children.** An introduction to the study of children who deviate from the average in mental, physical, and social characteristics. The course includes a

study of the characteristics of such children and the adaptation of educational procedures to their abilities and disabilities. I, II; 3 hours, or ½ unit. Prerequisite: Psychology 100. JOHNSON, KIRK.

318. **Workshop and Laboratory in Education of Exceptional Children.** Observation of special laboratory classes of various types of exceptional children; group discussions; conferences with specialists as consultants; work on a project of particular concern to the individual student. S; 4 hours, or 1 unit for four weeks; 8 hours, or 2 units for eight weeks. Prerequisite: Senior standing.

319. **Special Education of the Deaf.** Survey of the curriculum and techniques in preschools, kindergartens, and primary and intermediate levels as applied to the hard-of-hearing, deafened, and deaf child. A study of sense training, lip reading, vocabulary development, reading techniques, language and speech development, auditory training, and curriculum construction. I; 5 hours, or 1 to 1½ units. Prerequisite: First three years of curriculum for teachers of the deaf, or equivalent.

320. **Special Education of the Deaf.** Continuation of Education 319. II; 5 hours, or 1 to 2 units. Prerequisite: Education 319.

321. **Care and Education of Orthopedically Handicapped Children.** Survey of orthopedic handicaps in children, psychological and social effects of such handicaps, and the kinds of schools and services provided for the education of the various types of crippled children. The education of the cerebral palsied child is emphasized. S; 4 hours, or 1 unit. Prerequisite: A teacher's certificate, or senior standing, or a major in some area of special education.

322. **Psychology and Education of the Mentally Handicapped.** A study of the social, emotional, physical, and learning characteristics of mentally handicapped children; methods of diagnosis and differentiation; educational organization and teaching techniques employed for their rehabilitation. I; 3 hours, or ½ unit. Prerequisite: Education 231; senior standing. JOHNSON.

323. **Psychology and Education of the Mentally Handicapped.** Continuation of Education 322, with emphasis on curriculum. II; 3 hours, or ½ unit. Prerequisite: Education 322. JOHNSON.

324. **Mental and Educational Measurement of Exceptional Children.** Designed to develop an understanding of and ability to interpret the results of psychological and educational tests. Practice is provided in test administration, with emphasis on diagnosis and problems encountered in testing acoustically handicapped, orthopedically handicapped, visually handicapped, mentally handicapped, and defective of speech. II; 3 hours, or ½ unit. Prerequisite: Education 317, or consent of instructor. KIRK.

336. **Primary Reading.** Critical evaluation of current schools of thought with regard to the teaching of reading and an analysis of the concept of learning as well as the meaning of reading upon which each school is based. Attention is given to reading as a part of the total growth process of the child and to knowledge of methods and materials used in teaching beginning reading. I, II; 3 hours, or ½ unit. Prerequisite: Education 101, 201, and 230. STENDLER.

337. **Art Education in the Elementary School.** Methods, plans, and materials for teaching art as an integral part of the total educational program in the elementary school. I, II; 3 hours, or ½ unit. Prerequisite: Education 101, 201, and 230. FROTHINGHAM, SCHULTZ.

354. **Audio-Visual Materials and Problems.** Audio-visual materials will be examined from the point of view of their effectiveness and possible utilization in the school program. Recent investigations on materials and methods of presentation will be studied to ascertain their pedagogical implications. The technical and administrative problems of integrating audio-visuals into the school curriculum are considered. I, II; 3 hours, or ½ unit. Prerequisite: Education 211, 231, or 241; senior standing. PETERSON.

370. **Agricultural Education for First-Year Teachers.** Specific help with the problems of beginning teachers. Campus meetings in August and November. Other meetings in centers in the state convenient to first-year teachers. Visits by instructor to schools

in which first-year teachers are employed. I; 3 hours, or ½ unit. Prerequisite: Education 276 and 277. PHIPPS.

381. **Principles of Vocational Education.** Study of basic concepts and practices of modern vocational education. I, II; 3 hours, or 1 unit. MAYS.

383. **Problems of Industrial Education.** A survey of the problems and practices of the several phases of industrial education. I, II; 3 hours, or 1 unit. MAYS.

385. **Principles of Vocational Guidance.** Basic concepts and practices of vocational guidance in public schools. What the teachers can do in vocational guidance. I, II; 3 hours, or 1 unit. MAYS.

390. **Elements of Educational Statistics.** Designed for terminal value for professional training of students not intending to pursue advanced graduate work, and for introductory value for students continuing graduate study in education. The course includes descriptive statistics, the nature of measurement in education, introduction to regression, correlation analysis, statistical inference, and the presentation and interpretation of statistical data in educational literature. I, II; 3 hours, or 1 unit. ODELL.

391. **Introduction to Evaluation.** Practice and demonstration of the techniques of measurement with particular emphasis on their relation to the principles of educational evaluation and to a technique of curriculum development. The student will have an opportunity to practice the techniques in his major field. Such topics as certain relevant statistical concepts, the planning of a school evaluation program, and the use of standardized achievement tests are also considered. I, II; 3 hours, or 1 unit. HASTINGS.

## AGRICULTURAL EDUCATION

### Courses for Advanced Undergraduates

276. **Practice in Agricultural Education.** Supervised experience in the work of a teacher of vocational agriculture during a six-weeks period; planning programs of agricultural education; teaching high school, young farmer, and adult-farmer classes; providing facilities; evaluating outcomes; supervising practice; advising school-sponsored organizations; counseling students; keeping records and making reports. I, II; 5. Prerequisite: Education 201, 211, and 240; registration in Agricultural Education 277. DEYOE, PHIPPS, WEISS.

277. **Programs and Procedures in Agricultural Education.** Preparation for a successful experience in practice teaching and for beginning work as a teacher of vocational agriculture. Procedures in planning a community program of agricultural education; teaching high school, young farmer, and adult-farmer classes; providing facilities; evaluating outcomes; supervising practice; advising school-sponsored organizations; counseling students; keeping records and making reports. I, II; 5. Prerequisite: Education 201, 211, and 240; registration in Agricultural Education 277. DEYOE, PHIPPS, WEISS.

## INDUSTRIAL EDUCATION

### Courses for Undergraduates

181. **Industrial Arts.** Beginning course in woodwork problems of shopwork in wood and related technical material for shop teachers. I, II; 4. HUMBLE, KARNES.

182. **Advanced Course in Woodwork.** Advanced course in design and construction of woodwork projects with related technical information. I, II; 4. Prerequisite: Industrial Education 181. HUMBLE, KARNES.

183. **The General Shop.** Problems and projects of the general shop. Exercises, projects, and problems in sheet metal, electrical work, and bench metal work. II; 4. KARNES.

184. **Advanced Metal Work.** Advanced course in sheet metal and bench metal work. I; 4. Prerequisite: Industrial Education 183. KARNES.

### Courses for Advanced Undergraduates and Graduates

381. **Principles of Vocational Education.** Same as Education 381. Study of basic concepts and practices of modern vocational education. I, II; 3 hours, or 1 unit. MAYS.

383. **Problems of Industrial Education.** Same as Education 383. A survey of the problems and practices of the several phases of industrial education. I, II; 3 hours, or 1 unit. MAYS.

385. **Principles of Vocational Guidance.** Same as Education 385. Basic concepts and practices of vocational guidance in public schools. What the teachers can do in vocational guidance. I, II; 3 hours, or 1 unit. MAYS.

## ELECTRICAL ENGINEERING

*Professors:* J. D. RYDER (Head of Department), W. L. EVERITT, M. A. FAUCETT, G. H. FETT, V. P. HESSLER, E. C. JORDAN, C. A. KEENER, A. R. KNIGHT, J. O. KRAEHENBUEHL, E. B. PAINE (Emeritus), M. B. REED, E. A. REID, J. K. TUTHILL, J. T. TYKOCINER (Emeritus).

*Associate Professors:* L. B. ARCHER, W. L. EMERY, H. N. HAYWARD, M. S. HELM, H. W. HORN, T. A. MURRELL, C. C. NASH, G. R. PEIRCE, P. F. SCHWARZLOSE, C. E. SKRODER, H. M. VON FOERSTER, N. WAX, J. E. WILLIAMS.

*Assistant Professors:* W. G. ALBRIGHT, D. S. BABB, A. D. BAILEY, J. A. BARKSON, P. A. BAUMAN, L. R. BLOOM, W. H. BYERS, M. H. CROTHERS, E. F. DEMERS, C. E. DRUMHELLER, P. R. EGBERT, R. S. ELLIOTT, W. J. FRY, D. F. HANG, J. W. HOFFMAN, P. K. HUDSON, M. S. MCVAY, W. E. MILLER, R. H. NAU, J. P. NEAL, H. K. POLK, R. M. WAINWRIGHT, H. D. WEBB, E. K. WEISE.

*Associates:* E. W. ERNST, J. E. ETTER, F. J. FRY, E. C. HAYDEN, D. F. HOLSHOUSER, J. J. MYERS, G. A. PETTICREW.

*Instructors:* L. O. BROWN, A. S. CHODAKOWSKI, C. L. COATES, M. GILDEN, C. V. JAKOWATZ, J. U. JEFFRIES, H. W. KATZ, I. KAUFMAN, H. E. KOENIG, G. D. MCMULLEN, B. SILVERMAN, B. SMITH, S. W. TEHON, R. E. WENDT, B. J. WILSON.

*Assistants:* J. M. ANDERSON, M. C. ANDREWS, M. L. BABCOCK, A. J. BARRETT, R. E. BRANDES, H. C. BREARLEY, H. A. BRUST, K. R. BRUNN, K. N. BURNS, R. W. BURTNESS, W. W. CANNON, M. S. CASLER, M. CHRISTENSEN, W. H. CHRISTOFFERS, G. L. CLARK, R. P. COLBERT, W. F. DEBOICE, R. H. DUHAMEL, F. DUNN, M. L. EMBREE, M. FISHER, K. FONG, V. J. FOWLER, S. K. GHANDHI, R. E. GOROZDOS, C. W. GUSTAFSON, R. C. HANSEN, C. H. A. HEITZEBERG, N. HOLONYAK, L. L. HOWARD, R. F. HYNEMAN, C. T. A. JOHNK, G. P. KAFALAS, B. D. KIRKWOOD, J. F. KOENIG, G. KVITEK, I. A. LESK, R. T. LOEWE, J. W. MCNABB, T. R. O'MEARA, B. R. MYERS, R. C. PRICE, J. A. SALOOM, P. D. SMITH, R. S. SMITH, E. M. STRYKER, K. TOMAN, R. A. TORKILDSEN, W. WELKOWITZ, C. R. WILLIAMS, H. S. WU, N. YARU.

### Courses for Undergraduates

114. **Wiring and Illumination.** Fundamentals of commercial and industrial illumination and wiring practice. I, II; 3. Prerequisite: Sophomore standing, or consent of instructor.

126. **Electric Circuits and Fields.** Study of units and relations in electric and magnetic circuits and fields. Basic concepts of circuit parameters. I, II; 4. Prerequisite: Physics 103; Mathematics 132; credit or registration in Physics 104 and Mathematics 142.

## Courses for Advanced Undergraduates

202. **Direct and Alternating Current Circuits and Machines.** Fundamental principles of electric circuits and machines. For students in aeronautical, construction and drainage option of agricultural, ceramic, civil, and metallurgical engineering. I, II; 2. Prerequisite: Physics 103 and 104; Mathematics 147 or 142; credit or registration in Electrical Engineering 203.

203. **Direct and Alternating Circuits and Machines Laboratory.** To accompany Electrical Engineering 202. I, II; 1. Prerequisite: Credit or registration in Electrical Engineering 202.

204. **Applications of Electrical Equipment.** Applications of electricity for industrial uses. For students in ceramic and metallurgical engineering. I, II; 2. Prerequisite: Electrical Engineering 202 and 203; credit or registration in Electrical Engineering 205.

205. **Electrical Equipment Laboratory.** To accompany Electrical Engineering 204. I, II; 1. Prerequisite: Credit or registration in Electrical Engineering 204.

216. **Transit Engineering.** The application of electricity to the transportation systems. I, II; 3. Prerequisite: Electrical Engineering 202, 306, or 320, and 203, 307, or 321. TUTHILL and others.

217. **Electrical Measurements.** A survey of devices and methods of electrical measurements for students with a limited background in electrical engineering. I; 3. Prerequisite: Electrical Engineering 202 and 203.

256. **Methods and Problems in Communication Engineering I.** Application of higher mathematics to the solution of engineering problems in communication circuits and field theories. Solutions of non-linear electrical and magnetic systems. Designed as an elective for students in electrical engineering, communications, and engineering physics. I; 3. Prerequisite: Mathematics 345; Electrical Engineering 340 and 341; consent of instructor.

258. **Methods and Problems in Communication Engineering II.** Applications of higher mathematics to the solution of engineering problems in communication circuits and problems in theories. Solutions of non-linear electrical and magnetic systems. Designed as an elective for students in electrical engineering communications and engineering physics. II; 3. Prerequisite: Electrical Engineering 256.

260. **Fundamentals of Illumination.** Fundamentals of illumination engineering design and practice. I, II; 3. Prerequisite: Electrical Engineering 126; Mathematics 142; Physics 104.

268. **Fundamentals of Illumination Engineering.** Fundamentals of sources, point and surface illumination and design. I, II; 2. Prerequisite: Senior standing in electrical engineering.

271. **Electrical Engineering Problems.** I, II; 1 to 3. Prerequisite: Approved written application to department.

272. **Electrical Engineering Problems.** I, II; 1 to 3. Prerequisite: Approved written application to department.

288. **Economic Aspects of Engineering.** Fundamental principles of engineering economy. I, II; 3. Prerequisite: Junior standing in electrical engineering; Electrical Engineering 320.

290. **Seminar.** Papers and discussions of current engineering topics. I, II; no credit. Prerequisite: Senior standing in electrical engineering.

292. **Seminar.** Papers and discussions of current engineering topics. I, II; 1. Prerequisite: Senior standing in electrical engineering.

297. **Thesis.** Preliminary reading and investigation. I; 0 to 3.

298. **Thesis.** Continuation of Electrical Engineering 297. Completion of thesis. II; 0 to 3.

299. **Inspection Trip.** I; no credit. Prerequisite: Senior standing in electrical engineering.

## Courses for Advanced Undergraduates and Graduates

306. **Direct and Alternating Current Circuits.** Fundamental electric and magnetic units; direct and alternating current circuit analysis; complex numbers and vector diagram solutions. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Physics 103 and 104; Mathematics 142 or 147; credit or registration in Electrical Engineering 307.

307. **Direct and Alternating Current Laboratory.** Circuits laboratory to accompany Electrical Engineering 306. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 306.

308. **Direct and Alternating Current Apparatus.** Generators and motors, transformers, rectifiers, and electronic devices. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 306 and 307; credit or registration in Electrical Engineering 309.

309. **Direct and Alternating Current Laboratory.** Machines laboratory to accompany Electrical Engineering 308. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 308.

320. **Circuit Analysis.** Detailed and analytical solution of periodic current circuits; networks and network theorems; coupled circuits. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 126; Physics 104; credit or registration in Mathematics 341, 342, 343, or 345, and Electrical Engineering 321.

321. **Circuit Laboratory.** To accompany Electrical Engineering 320. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 320.

322. **Circuit Analysis.** Continuation of Electrical Engineering 320. Wave analysis; three-phase circuits; three-phase power and energy measurements; symmetrical components analysis; filters; transients. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 323.

323. **Circuit Laboratory.** To accompany Electrical Engineering 322. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322.

327. **Theory of Measurements.** Precise measurement of electrical quantities and the application of measurement theory to engineering problems. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322.

330. **Electrical Machinery.** Transformers and polyphase induction motors. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 322 and 323; credit or registration in Electrical Engineering 331.

331. **Electrical Machinery Laboratory.** To accompany Electrical Engineering 330. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 330.

332. **Electrical Machinery.** Synchronous machines, single-phase motors, direct-current machines, application. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 330 and 331; credit or registration in Electrical Engineering 333.

333. **Electrical Machinery Laboratory.** To accompany Electrical Engineering 332. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 332.

334. **Electrical Power Apparatus.** Single and three-phase transformers. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322 and 335.

335. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 334. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 334.

336. **Electrical Power Apparatus.** Synchronous and induction generators and motors. I, II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 334 and 335; credit or registration in Electrical Engineering 337.

337. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 336. I, II; 2 hours, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 336.

338. **Electrical Power Apparatus.** Direct-current generators and motors, converters, single-phase motors, frequency changers, duty cycles. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 335 and 336; credit or registration in Electrical Engineering 338.

339. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 338. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 338.

340. **Electronics.** High-vacuum electron tubes, emission, electron ballistics, tube characteristics, equivalent circuits, linear amplifier circuits and characteristics, gas tubes, phototubes. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 341.

341. **Electronics Laboratory.** To accompany Electrical Engineering 340. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 340.

347. **Industrial Electronics.** Feedback systems, rectifiers, amplifiers, controls, elements of design. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 340 and 341; credit or registration in Electrical Engineering 330 or 334.

349. **Electron Tube Circuits.** Linear and nonlinear amplifiers, fundamentals of modulation and detection, oscillators, rectifiers. I, II; 5 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322, 323, 340, and 341; credit or registration in Electrical Engineering 353.

351. **Networks and Lines.** Reactance networks, general transmission lines, equations, low-loss lines, reflections. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322.

353. **Radio Circuits.** Impedance transformation, reactance network synthesis as applied to radio frequencies; modulation theory; principles of receivers and transmitters. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322, 340, and 351; credit or registration in Electrical Engineering 349.

355. **Fields and Waves.** Theory of VHF and microwave generators; electromagnetic fields, radiation and propagation of electromagnetic energy, radiating systems. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

361. **Elements of Illuminating Engineering Design.** Application of the fundamentals of optics and light to developments in the design of illumination equipment and lighting installations. I, II; 4 hours, or 0 to ½ unit. Prerequisite: Mathematics 132 and 142; Physics 104; Electrical Engineering 260.

362. **Principles of Illuminating Engineering.** Concept and units in light calculations; calculation of illumination from point, line, and surface sources; interpretation of photometric and test data. I, II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 120; credit or registration in Electrical Engineering 363; Mathematics 345; Physics 270.

363. **Illumination and Photometry Laboratory.** Photometry and illumination measurements. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 362.

364. **Illumination Design and Economics.** Design of lighting systems for natural and artificial illumination; applications for interiors and exteriors in both commercial and industrial installations; economic studies; design of reflectors and lighting equipment. II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 362 and 363; credit or registration in Electrical Engineering 365.

365. **Illumination Design Laboratory.** To accompany Electrical Engineering 364. Checking and constructing equipment and installation designs in lighting. II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 364.

366. **Illumination Sources.** Study of natural and artificial light sources covering combustion, incandescent, and gaseous lamps with emphasis on fundamental laws; radiation measurements and colorimetry. II; 3 hours, or 0 to ½ unit. Prerequisite: Credit or registration in Electrical Engineering 364 and 365.

**374. Electrical Energy Measurements, System Protection.** Transmission equipment, energy meters, protective relays. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Registration in Electrical Engineering 334 and 375, or consent of instructor.

**375. Energy Measurement and Protection Laboratory.** To accompany Electrical Engineering 374. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Registration in Electrical Engineering 374.

**376. Power Circuit Analysis.** Advanced analysis of circuits used for power transmission and distribution. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322 and 323.

**377. Machine Application and Control.** Analysis of electrical machinery applications; controls. II; 3 or 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 336 and 337; credit or registration in Electrical Engineering 338.

**378. Fundamentals of Power Transmission Engineering.** Fundamentals of electrical and mechanical design of power transmission systems. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Credit or registration in Electrical Engineering 334 and 335.

**379. Power Transmission.** Advanced analysis of electric power transmission systems, faults, stability. II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 336, 377, and 378.

**381. Pulse Techniques.** Response of electrical systems to repeated transients. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

**386. Fundamentals of Servomechanisms.** Fundamental knowledge required in the analysis of servomechanisms and automatic control devices. II; 4 hours, or 0 to 1 unit. Prerequisite: Senior standing in electrical engineering, or consent of instructor.

**387. Electrical Design.** Fundamental principles of electrical power apparatus design with particular application to transformers and generators. Properties of materials in common use; construction of coils; magnetic attraction; stored energy; field mapping; heat dissipation; temperature rise and rating of apparatus. For students selecting the option in power. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 330 and 331, 334 and 335.

**389. Communication Design.** Design, construction, and complete test of a radio transmitter or receiver. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

## ENGINEERING

*Professors:* C. H. Casberg, J. S. Crandell, J. O. Draffin, H. H. Jordan (in charge), L. A. Rose.

*Associate Professors:* W. W. Hay, E. F. Heater, L. C. Pigage, K. A. Windesheim.

*Instructor:* R. D. Henson.

*Assistant:* G. B. Foster.

### Courses for Undergraduates

**140. Transportation.** Transportation systems; history and technical development of pipe lines, rail, highway, waterway, and air transport; organization and interrelation. I; 2. Prerequisite: Sophomore standing. Hay.

**141. Transportation.** Continuation of Engineering 140. Regulation of transportation systems: technical, operating, financial, governmental; government versus private ownership and operation; technical and economic problems of transport systems; labor personnel and management problems; history and technical development of city transit systems. II; 3. Prerequisite: Sophomore standing. Hay.

### Courses for Advanced Undergraduates

216. **Engineering Reports.** Study and practice in the preparation of the main types of reports called for in engineering practice. I, II; 3. Prerequisite: An elective for seniors; juniors admitted with consent of instructor. FOSTER, HEATER, ROSE, WINDESHEIM.

220. **History of Engineering.** Study of the important elements in the growth of the art and science of engineering from ancient times to the present; lives of some of the men who have been leaders; effect of engineering on the social conditions of the various periods. I, II; 2. Prerequisite: Junior standing. DRAFFIN.

230. **Labor Relations.** The individual and his coordination, orientation, and maintenance in the group and in the business organization. The service, functions, regulations, union aspects, wage-price structure, and public considerations affecting labor-management relationships in various organizations. I, II; 3. Prerequisite: Junior standing in engineering, or consent of instructor. PIGAGE.

239. **Industrial Development and Supervision.** Technological influences in the development of modern industry; care, inspection, and maintenance of plant, equipment, raw materials, and products; reduction of costs; safety and health of workers; accident and fire prevention; engineering reports and job analysis; responsibilities of supervisors. I, II; 3. Prerequisite: Junior standing. CASBERG.

292. **Engineering Law.** Contracts, evidence, torts, equity, real property, corporations, agency, sales, negotiable instruments, water rights, patent rights, special assessments, contract letting, general conditions. I, II; 3. Prerequisite: Senior standing in engineering or architecture. CRANDELL, HENSON.

## ENGLISH

### (Including English Literature, American Literature, Rhetoric and Composition, and Business English)

*Professors:* G. N. RAY (Head of Department), C. R. ANDERSON, T. W. BALDWIN, J. W. BEACH (Visiting), E. BERNBAUM (Emeritus), J. T. FLANAGAN, H. F. FLETCHER, G. T. FLOM (Emeritus), R. A. GETTMANN, M. T. HERRICK, H. N. HILLEBRAND (on leave), P. N. LANDIS, H. LARSEN, J. J. PARRY, C. W. ROBERTS, A. W. SECORD, R. M. SMITH.

*Associate Professors:* M. S. GOLDMAN, J. N. HOOK, B. A. MILLIGAN, C. H. SHATTUCK, LEAH F. TRELEASE, R. B. WEIRICK.

*Assistant Professors:* GARRETA H. BUSEY, G. B. EVANS, MARGARET FRENCH, G. P. HASKELL, A. G. HOLADAY, CORNELIA P. KELLEY, RUTH KELSO, E. G. MATHEWS, ESTHER H. RAPP, CLARISSA RINAKER (on leave), R. W. ROGERS, G. B. STILLWELL, CAROLINE F. TUPPER (Emerita), L. C. WARREN, F. W. WEEKS.

*Instructors:* HELEN BEVERIDGE, MARGARET BLOOM, W. F. BUCKLER, N. P. DAVIS, J. A. HAMILTON, B. HARKNESS, LOIS HARTLEY, EFFIE HUNT, J. K. QUINN, H. F. ROBINS, H. W. SARGENT, J. H. SCHACHT, A. L. SCOTT, G. SCOUFFAS, A. SHERBO, W. STONE, F. G. TOWNSEND, W. S. WORDEN.

*Assistants:* J. D. BAILEY, J. R. BASH, R. W. BARZAK, J. E. BELLAMY, CAROL BRASURE, R. G. BROOKS, MARJORIE H. BROWN, J. BULLARO, G. O. CAREY, J. J. CARROLL, W. J. CHAMBERLIN, C. E. CHUMLEY, W. E. COLBURN, T. COLEMAN, G. S. CONKIN, M. A. CRANE, H. K. CROCKETT, ELIZABETH M. CROOK, M. M. CULVER, J. L. DONOVAN, PAULINE DRAWVER, T. H. DRISCOLL, J. H. DUGAS, W. E. EDENS, J. L. FORBES, J. B. FOSTER, MARY A. FOULK, R. E. FREEMAN, R. R. GARD, KATHARINE T. GILL, J. B. GLEASON, MARJORIE GOODRICH, S. L. GROSS, G. B. HARDY, A. HAYMAN, F. E. HAZARD, VIRGINIA HEGLAND, V. E. HERDER, MARY A. HUSSEY, F. W. JAUCH, G. E. JONES, JULIA D. KNUPPEL, R. E. LAMBERT, R. S. LEEVER, J. T. MAGUIRE, T. O. MALLORY, W. C. MCAVOY, D. E. MCCOY, SONIA MILLER, F. B. MOAKE, S. MOSS, IRIS D. MUELLER, W. B. NEWCOMB, CONSTANCE NICHOLAS, H. K. NIXON, R. H.

O'Bannon, Dorothy Odell, R. B. Ogle, R. E. O'Neill, H. E. Pendleton, H. Presley, W. D. Randolph, W. H. Reuter, O. L. Rice, J. E. Robinson, W. C. Rogahn, J. S. Romine, E. Rosenberg, D. Rudolph, H. F. Salerno, G. A. Sanderstrom, S. K. Shelton, E. H. Siemons, J. H. Smith, J. E. Smythe, B. A. Sokoloff, R. L. Stevens, Margaret O. Stewart, P. R. Stewart, W. M. Stringfellow, A. C. Tillman, W. T. Tucker, L. Wagy, S. Warschausky, G. T. Watkins, J. H. Webb, R. Wiegand, C. T. Wilkins, H. W. Wilson, Verna D. Wittrock, Dorothy W. Zimmerman, Margaret B. Zwick.

## Requirements for L.A.S. Students

**Major:** Twenty hours in English excluding Rhetoric 100, 101, 102, 151, 200, 242, 271, 272; English 101, 102, 103, 121, 122, 291, and including seventeen hours in English or American literature, at least nine of which must be chosen from the advanced groups.

**Minors:** Twenty hours in (a) Latin, Greek, French, German, Spanish, Italian, or Portuguese; or (b) in any two of those languages; or (c) in one of those languages and philosophy; or (d) in one of those languages and history; or (e) in history and philosophy; or (f) program in medieval studies sponsored by the Division of the Humanities. No language courses may be regarded as satisfying the minor requirements if they are excluded from the majors of the language departments, with the exception of elementary courses in Greek and Latin, French 103, 104, Italian 103, 104, and Spanish 103 and 104. At least eight hours must be taken in each subject, if two are chosen.

English majors who intend to teach in secondary schools must see the adviser on special curriculum.

**Major in Composition:** See page 343.

## ENGLISH LITERATURE

### Courses for Undergraduates

**103. Introduction to Fiction.** Understanding of fiction through the reading and discussion of representative poems. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 102 and 103, satisfies the humanities requirement in general education. Busey (in charge), Harkness, Landis, Quinn, Weirick, Worden.

**102. Introduction to the Drama.** Understanding of drama through the reading and discussion of representative plays. The reading list will include selections from Greek, Elizabethan, and modern English, continental, and American drama. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 101 and 103, satisfies the humanities requirement in general education. Busey, Hamilton, Haskell (in charge), Rapp, Rogers, Sherbo, Worden.

**103. Introduction to Fiction.** Understanding of fiction through the reading and discussion of representative short stories and novels. The reading list will include Jane Austen's *Pride and Prejudice,* Balzac's *Père Goriot,* Dostoevski's *Crime and Punishment,* E. M. Forster's *A Passage to India,* and Hemingway's *A Farewell to Arms.* I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 101 and 102, satisfies the humanities requirement in general education. Gettmann, Ray, and others.

**121. Chief English Writers Before 1800.** *Canterbury Tales, Utopia,* three plays of Shakespeare, *Paradise Lost, Gulliver's Travels, Tom Jones, Life of Johnson, Rasselas.* Particularly recommended for students in professional and technical courses, such as law, medicine, commerce, engineering, etc. I, II; 4. Credit is not given for English 121 in addition to English 101, 102, and 103. This course, plus English 122, satisfies the humanities requirement in general education. Prerequisite: Sophomore standing,

or exemption from Rhetoric 102. BELLAMY, BROOKS, DRAWVER, EVANS, FOSTER, FRENCH, HARTLEY, HUNT, MCAVOY, MCCOY, MILLIGAN (in charge), ROGERS, SCOTT, SHERBO, STILLWELL, STONE, WARREN.

122. **Chief English Writers of the Nineteenth Century.** Wordsworth, Byron, Carlyle's *Past and Present*, Arnold's prose and poetry, FitzGerald's *The Rubaiyat of Omar Khayyam*, readings from T. H. Huxley, Browning's poems, and two novels. Particularly recommended for students in professional and technical courses, such as law, medicine, commerce, engineering, etc. I, II; 4. Credit is not given for English 122 in addition to English 101, 102, and 103. This course, plus English 121, satisfies the humanities requirement in general education. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. BAILEY, BUCKLER, BUTLER, DUGAS, FOSTER, FRENCH, HARKNESS, HARTLEY, KELSO, MCCOY, MILLIGAN (in charge), ROBINS, TOWNSEND.

131. **Introduction to Shakespeare.** I, II; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. LANDIS, SHATTUCK, SMITH, WARREN.

## Courses for Advanced Undergraduates

201. **Literary Study of the Bible.** I; 3. Prerequisite: Six hours of English literature. FLETCHER.

215. **English Poetics.** A study of the nature of poetry, of the history and theory of poetic forms, and of the more important metrical patterns in English. I; 2. GOLDMAN.

231. **Shakespeare.** I, II; 3. EVANS.

235. **English Drama Previous to Shakespeare.** From the beginning to 1600. I or II; 3. HOLADAY.

245. **English Literature from 1688 to 1789.** Swift, Defoe, Steele, Addison, Dryden, Pope, Gray, Goldsmith, Johnson, etc. I or II; 3. SECORD.

246. **English Literature from 1789 to 1837.** Wordsworth, Coleridge, Scott, Byron, Shelley, Keats. I; 3. LANDIS.

251. **Great Novelists of the Eighteenth Century.** Defoe, Richardson, Fielding, Smollett, Sterne, Goldsmith, etc. II; 3. SECORD.

252. **Great English Novelists of the Nineteenth Century.** Austen, Scott, Brontë, Thackeray, Dickens, Meredith, James, Hardy, Conrad, Eliot. I or II; 3. GETTMANN.

253. **Great Foreign Novelists in Relation to the English Novel.** Goethe, Hugo, Balzac, Flaubert, Zola, Turgenev, Dostoevski, Tolstoi. I, II; 3. GETTMANN.

263. **Early Victorian Literature.** Victorian literature from 1832 to 1859. I; 3. RAY, TOWNSEND.

264. **Victorian Literature from 1859 to 1901.** Browning, Rossetti, Swinburne, Arnold, Morris, Pater, Wilde, Kipling. II; 3. RAY, TOWNSEND.

265. **Tennyson and His Contemporaries.** An intensive reading of the principal poems. I; 3. LANDIS.

266. **Browning.** An intensive reading of the principal poems. II; 3. LANDIS.

273. **Poetry Since 1920.** Investigation of the ideas and methods of representative British and American poets from 1920 to the present day. I, II; 3. Prerequisite: Six hours of English literature. QUINN.

275. **A Study of Biography.** A study of biography from Boswell to the present day, intended primarily for the general reader. II; 3. KELSO.

281. **Development of the Modern Drama.** Readings and lectures. I, II; 3. HERRICK, SHATTUCK.

291. **Teaching of English Literature.** I; 2. Prerequisite: Nine hours of English literature. HOOK.

297. **Thesis and Honors.** I; credit to be arranged. Prerequisite: Senior standing. WARREN and others.

298. **Thesis and Honors.** II; credit to be arranged. Prerequisite: Senior standing. WARREN and others.

## Courses for Advanced Undergraduates and Graduates

311. **Chaucer.** I; 3 hours, or ½ to 1 unit. STILLWELL.

313. **Introduction to the Literature of the Middle Ages.** The literature of western Europe from 1000 to 1500. The literary background and the literature of the castle. I; 3 hours, or ½ to 1 unit. PARRY.

314. **Introduction to the Literature of the Middle Ages.** The literature of western Europe from 1000 to 1500. Lyric poetry, the literature of the cloister and the tavern. II; 3 hours, or ½ to 1 unit. PARRY.

325. **English Literature from 1588 to 1660.** Survey of English literature of the Renaissance. Sidney, Marlowe, Donne, Jonson, Herrick, Bacon, Burton, and other writers. II; 3 hours, or ½ to 1 unit. MILLIGAN.

326. **Spenser.** II; 3 hours, or ½ to 1 unit. GOLDMAN.

336. **English Drama Exclusive of Shakespeare.** From 1600 to 1700. I, II; 3 hours, or ½ to 1 unit. HERRICK.

338. **Tragedy.** Comparative study of masterpieces in several periods of Western culture. Reading and discussion of ancient, English Elizabethan and Stuart, and more recent drama. II; 3 hours, or ½ to 1 unit. WARREN.

342. **The Poetry of Milton.** Origins, forms, artistic and ethical values; Milton's place in English literary history. II; 3 hours, or ½ to 1 unit. FLETCHER.

346. **The Age of Dryden.** A study of Restoration literature, dramatic and non-dramatic, centered around Dryden. I; 3 hours, or ½ to 1 unit. EVANS.

347. **Alexander Pope.** Pope's prose and poetry, together with selections from Pope's classical models (in translation). II; 3 hours, or ½ to 1 unit. ROGERS.

349. **Dr. Johnson and His Circle.** The principal writings of Johnson, Boswell, Goldsmith, Reynolds, Burke, Gibbon, and Sheridan. Lectures will establish the position of Johnson's circle in the social and literary life of the second half of the eighteenth century. II; 3 hours, or ½ to 1 unit. ROGERS.

351. **The Mid-Victorian Novel.** Thackeray, Charlotte Brontë, Mrs. Gaskell, Dickens, George Eliot, Trollope. II; 3 hours, or ½ to 1 unit. RAY.

355. **Survey of English Literature.** From the beginning to 1700. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. FRENCH, HOLADAY, MILLIGAN, PARRY, ROGERS.

356. **Survey of English Literature.** From 1700 to 1900. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOLADAY, PARRY, ROGERS.

363. **Introduction to Comparative Literature.** Same as German 363. A comparative study of great books in Greek, Roman, Italian, and Spanish literature. I; 3 hours, or ½ unit. GOLDMAN, HAMILTON, HOLADAY, LANDIS, RAPP, VAN HORNE, WARREN.

364. **Introduction to Comparative Literature.** Same as German 364. A comparative study of great books in French, German, and English literature. II; 3 hours, or ½ unit. This course, plus English 363 and 253, satisfies the humanities requirement in general education. GOLDMAN, HOLADAY, JACOB, LANDIS, RAPP, REHDER.

371. **History and Principles of Literary and Rhetorical Criticism: Aristotle to Sidney.** Same as Speech 371. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

372. **History and Principles of Literary and Rhetorical Criticism: Sidney to the Present.** Same as Speech 372. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

382. **The Plays of Bernard Shaw.** I; 3 hours, or ½ to 1 unit. Prerequisite: English 281. SHATTUCK.

## AMERICAN LITERATURE

### Courses for Undergraduates

113. **American Literature.** A survey of American literature with lectures on the historical and cultural background. From 1620 to the Civil War. I; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. HARTLEY, HASKELL, KELLEY, SCOTT, SCOUFFAS, WORDEN.

114. **American Literature.** A survey of American literature with lectures on the historical and cultural background. From the Civil War to the twentieth century. II; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. HARTLEY, HASKELL, KELLEY, SCOTT, SCOUFFAS, WORDEN.

144. **Contemporary Poetry.** American poetry from Whitman to Sandburg; and English poetry from the pre-Raphaelites to Masefield. II; 3. Prerequisite: Six hours of literature, or junior standing. WEIRICK.

### Courses for Advanced Undergraduates

283. **American Literature from 1870 to 1910.** I; 3.

284. **American Literature Since 1910.** II; 3.

285. **History of the American Short Story.** An historical survey of the American short story, from the early nineteenth century to about 1910, including the study of short-story technique and of the changes in subject matter and methods of development, and the reading of many representative short stories. I; 3. TRELEASE.

286. **History of the American Short Story.** An historical survey of the American short story from 1910 to the present, including the study of short-story technique and the changes in subject matter and methods of development, and the reading of many representative short stories. II; 3. TRELEASE.

### Courses for Advanced Undergraduates and Graduates

310. **Colonial and Eighteenth Century American Literature.** Two centuries of American literature, with major emphasis on such figures as John Smith, Winthrop, the Mathers, Edwards, Franklin, Jefferson, Paine, and Frenau. II; 3 hours, or ½ to 1 unit. DAVIDSON.

315. **The American Drama.** An historical survey of the American drama from the beginning to Clyde Fitch, including the reading of a large number of representative plays. I; 3 hours, or ½ to 1 unit. Offered in 1951-1952 and in alternate years. FLANAGAN.

316. **The American Drama.** An historical survey of the American drama from the time of Clyde Fitch to the present, including the reading of a large number of representative plays. II; 3 hours, or ½ to 1 unit. Offered in 1951-1952 and in alternate years. FLANAGAN.

318. **The American Novel: Cooper to Norris.** Cooper, Hawthorne, Melville, James, Twain, Howells, Norris. I or II; 3 hours, or ½ to 1 unit. DAVIDSON, HASKELL.

352. **American Literature: Irving to Whitman.** A study of the major American writers from 1800 to the Civil War, with particular emphasis on Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, and Whitman. I or II; 3 hours, or ½ to 1 unit. DAVIDSON.

353. **Studies in Middle Western Literature.** A survey of middle western literature from 1825 to Dreiser, with special emphasis on the development of realism in poetry and fiction. I; 3 hours, or ½ to 1 unit. Prerequisite: English 113 or 114 or one course in American history. Offered in 1952-1953 and in alternate years. FLANAGAN.

354. **Studies in Middle Western Literature.** A survey of middle western literature from Dreiser to the present, with special emphasis on the development of realism in poetry and fiction. II; 3 hours, or ½ to 1 unit. Prerequisite: English 113 or 114 or one course in American history. Offered in 1952-1953 and in alternate years. FLANAGAN.

375. **Henry James and the Technique of Fiction.** A study of the development of Henry James as a novelist, of the influence upon him, and of his influence on novelists of the twentieth century, chiefly American. I; 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor. KELLEY.

381. **The Twentieth Century American Novel.** The American novel during the twentieth century considered with reference to narrative technique, esthetic organization of subject matter and themes, social significance, and imaginative power. Novels by Dreiser, Fitzgerald, James, Hemingway, Lewis, Anderson, DosPassos, Wolfe, Faulkner, and Steinbeck. I or II; 3 hours, or ½ to 1 unit.

## RHETORIC AND COMPOSITION

**Major:** Twenty hours in English excluding Rhetoric 100, 101, 102, 151, 200, 242, 271, 272, English 101, 102, 103, 121, 122, 291, and including ten hours of English or American literature, at least six of which must be chosen from the advanced groups, and ten hours of composition chosen from Rhetoric 133, 144, 205, 206, 227, 230, 255, 256, and including at least one course in expository writing. With the permission of the adviser one of the following courses may be counted toward a composition major: Speech 263, 363, Journalism 227, 229, 266.

**Minors:** Twenty hours in (a) Latin, Greek, French, German, Spanish, Italian, or Portuguese; or (b) in any two of those languages; or (c) in one of those languages and philosophy; or (d) in one of those languages and history; or (e) in history and philosophy; or (f) in any one of these subjects and psychology. No language courses may be regarded as satisfying the minor requirements if they are excluded from the majors of the language department, with the exception of elementary courses in Greek and Latin, French 103, 104, Italian 103, 104, and Spanish 103, 104. At least eight hours must be taken in each subject, if two are chosen.

### Courses for Undergraduates

100. **Freshman Remedial Rhetoric and Composition.** Open to students who fail the placement test for admission to Rhetoric 101. Intensive review of fundamentals, with considerable practice in composition. Students passing this course will be admitted to Rhetoric 101 without further examination. I, II; no credit. ROBERTS and others.

101. **Freshman Rhetoric and Composition.** This course provides elementary training and practice in the comprehension and expression of written and oral English. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Passing grade on the placement examination or in Rhetoric 100. ROBERTS and others.

102. **Freshman Rhetoric and Composition.** This course provides elementary training and practice in the comprehension and expression of written and oral English. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Rhetoric 101. ROBERTS and others.

111. **English as a Foreign Language.** Essentials of English grammar and sentence structure for students whose native language is not English. Designed especially for students who are not taking full-time work because of inadequate preparation in English. I, II; 2. HUSSEY, WAGY.

113. **English as a Foreign Language.** Pronunciation of English for students whose native language is not English. I, II; 2. BEVERIDGE, GALPIN, HUSSEY.

114. **English as a Foreign Language.** Oral and written composition and reading for students whose native language is not English. I, II; 3. Prerequisite: Rhetoric 111, or consent of instructor. Rhetoric 114 and 115 fulfill English requirements for foreign students. HUSSEY, WAGY.

115. **English as a Foreign Language.** Continuation of Rhetoric 114. I, II; 3. Prerequisite: Rhetoric 114. Rhetoric 114 and 115 fulfill English requirements for foreign students. BEVERIDGE, GALPIN, HUSSEY, WAGY.

133. **Expository Writing.** Individual conferences to be arranged. I, II; 3. Prerequisite: Rhetoric 101 and 102; sophomore standing. BUCKLER, KELSO, SCHACHT, TOWNSEND.

144. **Narrative Writing.** Elements and practice of narrative writing. Not a course in short-story writing. I, II; 3. Prerequisite: Sophomore standing; Rhetoric 101 and 102. HAMILTON, ROGAHN, SCHACHT, STONE.

### Courses for Advanced Undergraduates

200. **Remedial Writing.** I, II; 3. Prerequisite: Rhetoric 101 and 102; failure on the qualifying examination in English. This course does not count for advanced hours toward graduation. BROOKS, CHUMLEY, CONKIN, CROOK, DUGAS, JONES, MILLER, NICHOLAS, O'BANNON, RUDOLPH, ZWICK.

205. **Advanced Narrative Writing.** I; 3. Prerequisite: Rhetoric 133 or 144, or similar writing beyond Rhetoric 101 and 102. QUINN, SCOUFFAS, WEIRICK.

206. **Advanced Narrative Composition.** II; 3. Prerequisite: Rhetoric 133 or 144, or similar writing beyond Rhetoric 101 and 102. QUINN, SCOUFFAS, WEIRICK.

227. **Advanced Expository Writing.** Essay writing. Course conducted mainly through personal conferences. I, II; 3. Prerequisite: Rhetoric 133 or 144. LANDIS.

230. **The Writing of Poetry.** The practice of the writing of poetry aided by the intensive study of examples. I, II; 3. Prerequisite: Junior standing and six hours of English literature, or consent of instructor. BUSEY.

242. **Teaching of English Composition.** II; 2. Prerequisite: Junior standing; nine hours of English composition. HOOK.

246. **Modern English Grammar.** Definition and meaning; the use of dictionaries, grammars; a survey of syntax, etc. I, II; 3. Prerequisite: Junior standing. HOOK, MATHEWS.

255. **Creative Writing.** Personal direction in writing: novel, story, play, poetry, essay. I; 2. Prerequisite: Senior standing; consent of instructor. BUSEY, QUINN, TRELEASE, WEIRICK.

256. **Creative Writing.** Personal direction in writing: novel, story, play, poetry, essay. II; 2. Prerequisite: Senior standing; consent of instructor. BUSEY, QUINN, TRELEASE, WEIRICK.

## BUSINESS ENGLISH

### Courses for Undergraduates

151. **Business Letter Writing.** This course is not counted toward a major in English I, II; 2. Prerequisite: Rhetoric 101 and 102. ANDERSON (in charge), CHAMBERLIN, DAVIS, FOULK, HERDER, MAGUIRE, SARGENT, SIEMONS, TUCKER, WEEKS, WIEGAND, WILKINS.

### Courses for Advanced Undergraduates

271. **Sales Writing.** Same as Journalism 288 and Marketing 288. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151; or consent of instructor. MAGUIRE, SARGENT, TUCKER.

272. **Report Writing.** I, II; 2. Prerequisite: Rhetoric 101, 102, and 151; or consent of instructor. ANDERSON, CHAMBERLIN, DAVIS, TUCKER, WEEKS.

# ENTOMOLOGY

*Professors:* W. P. Hayes (Head of Department), W. V. Balduf, G. C. Decker, G. S. Fraenkel, C. W. Kearns, H. H. Ross.

*Associate Professor:* V. G. Milum.

*Assistant Professors:* W. R. Horsfall, R. C. Sanborn.

*Assistants:* M. I. Cooper, H. E. Gray, D. L. Shankland, D. M. Tuttle.

## Requirements for L.A.S. Students

**Major:** Twenty hours in entomology, excluding Entomology 101, 102, 103, and 131. Zoology 318 and 321 may be applied for major credit. At least five hours must be taken from the advanced group.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: agronomy, bacteriology, botany, chemistry, horticulture, physiology, and zoology.

## Courses for Undergraduates

Note: Entomology 101, 102, and 103 are open to freshmen, and 131 to sophomores, without prerequisites. Either 101 and 102, or 103 are prerequisite to all other courses in the department. Recommended sequences of courses are Entomology 101, 102, 131, 308, 313, 316, 319, 320, for those desiring strictly practical or economic work; 103 and 322 for those interested in the cultural or biological values of insect study. For students whose major is entomology a desirable, though not required, sequence is Entomology 101, 102, 131, 308, 309, 310, 313, 316, 317, 318, 319, 320, 322, 323, and 324.

**101. Destructive and Useful Insects.** A practical course covering the fundamentals of methods of injury and benefit by insects, their morphology, physiology, metamorphosis, classification, and control. The recognition, nature of injury, life history, habits, and control of the most destructive pests of field crops, vegetables and fruits, household and stored products, domestic animals, and man. Lectures and discussions. Planned to be accompanied by Entomology 102, but may be taken alone. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Hayes, Horsfall, Kearns.

**102. Destructive and Useful Insects.** Laboratory studies of the subject matter covered in Entomology 101. Each lecture and discussion period of 101 is followed by the study of actual specimens of insects, insecticides, etc., illustrating their external and internal anatomy; the various types of mouth parts; metamorphosis; training in the keying out and classifying of insects to order and family; and control measures. Experience in the recognition of the specific pests discussed in 101 and the damage they do. I, II; 2. Prerequisite: Credit or registration in Entomology 101. Milum and others.

**103. Life of Insects.** A nontechnical course designed to give a balanced comprehensive picture of insect life: treats insect structures, growth, and relationships with other animal groups; life histories of the principal groups; modes of reproduction, movement, protection, communication, and behavior; interrelation with the physical and biotic environment, parasitism, transmission of diseases, predatism, pollination; how insects benefit and injure man, their control, and their roles in the history of man and the arts. Illustrated lectures and laboratory. This course fulfills a one-semester requirement in the biological sequence of the general education requirement in the College of Liberal Arts and Sciences. II; 4. Balduf.

**131. Essentials of Beekeeping.** Social life, habits, structures, seasonal management for production of honey and beeswax, and essential pollination of seed and fruit crops. Laboratory includes assembling equipment, apiary practice, and care of honey for market. I, II; 2. Prerequisite: Sophomore standing. Milum.

## Courses for Advanced Undergraduates and Graduates

**306. Special Problems.** For students ready to take up some special investigation which may be completed as an undergraduate study or the beginning of a thesis problem for an

advanced degree. It may also be used to prepare a thesis for scholastic honors. I, II; 2 to 5 hours, or ¼ to 1 unit. Prerequisite: Senior standing; any of the following: Entomology 131, 308, 309, 310, 313, 317, 318, 319, 320, 322, 323, 324, or Zoology 101 or 321. Balduf, Decker, Fraenkel, Hayes, Horsfall, Kearns, Milum, Ross.

**308. Insect Pests of Field Crops.** II; 3 hours, or ½ unit. Prerequisite: Entomology 101. Offered in 1952-1953 and in alternate years. Hayes.

**309. Morphology and Taxonomy of Immature Insects.** A study of the structures of nymphs, larvae, and pupae. Devoted to morphological studies which are followed by taxonomic studies in Entomology 310. I; 3 hours, or ½ unit. Prerequisite: Entomology 101; senior standing. Offered in 1951-1952 and in alternate years. Hayes.

**310. Morphology and Taxonomy of Immature Insects.** A study of the taxonomy of nymphs, larvae, and pupae. A sequence to Entomology 309. II; 3 hours, or ½ unit. Prerequisite: Entomology 309. Offered in 1951-1952 and in alternate years. Hayes.

**312. Entomology for Teachers.** Recognition of the chief orders of insects in their immature and adult stages, how they develop, life cycles, food, habitats, adaptations for feeding, oviposition, movement, protection, defense, making sound and other functions, interrelation with other organisms, environmental and social life. A collection of insects will be mounted, identified, and labeled. Field trips, laboratory, and discussions. S; 3 hours, or ½ unit. Prerequisite: One year of biology, zoology, or equivalent. Offered in 1951-1952 and every third year thereafter. Balduf.

**313. Medical and Veterinary Entomology.** Training in recognition, classification, methods of injury, habits, and control or destruction of insects, mites, and ticks which are predators, parasites, or disseminators of diseases among men and domestic animals. I; 4 or 5 hours, or ½ or 1 unit. Prerequisite: Entomology 101 and 102, or 103, or Zoology 320. Horsfall.

**316. Advanced Economic Entomology.** A consideration of the principles underlying ways and means for preventing injury to crops and various products. II; 3 hours, or ½ unit. Prerequisite: Entomology 101 or 103. Offered in 1952-1953 and in alternate years. Horsfall.

**317. Classification of Insects.** Orders with gradual metamorphosis, and principles of systematic entomology. The distinctive structural features of the orders comprising the Ametabola and Hetermetabola; comparison of various systems of classification of the orders; how to recognize the more common families; practice in keying to species. The principles embrace sources of material, segregation, and preparation of keys, descriptions, bibliographies, and outlines for revisional papers. I; 5 hours, or 1 unit. Prerequisite: Entomology 101 or 103, or equivalent.

**318. Classification of Insects.** Orders with complete metamorphosis, and principles of systematic entomology. Distinctive structural features of the orders comprising the subclass Holometabola; comparison of the various systems of classification of the orders; how to recognize the more common families; practice in keying to species; literature; biographies. II; 5 hours, or 1 unit. Prerequisite: Entomology 101 or 103, or equivalent.

**319. Chemical Control of Insects.** Discussion and actual practice in the most effective control measures for insect pests; training for professional or commercial work as an entomologist, pest control supervisor, or agricultural agent. II; 4 hours, or 1 unit. Prerequisite: Entomology 101 or 103; senior standing or a course in economic entomology. Kearns.

**320. Chemistry and Toxicology of Insecticides.** Fundamental information concerning the mode of action, the relationship of chemical structure to toxicity, and the physiological explanation of the chemical poisoning of insects. I; 3 hours, or ½ unit. Prerequisite: One year of biology, or equivalent in animal sciences; a course in organic chemistry; senior standing. Kearns.

**322. Insect Bionomics.** This phase of the biology of insects deals with life history and conditions of environment that favor abundance of insects representative of various habitats. II; 3 hours, or ½ unit. Prerequisite: Entomology 101 and 102, or 103, or Zoology 320; senior standing. Offered in 1951-1952 and in alternate years. Horsfall.

323. **Insect Physiology.** I; 5 hours, or 1 unit. Prerequisite: A course in internal morphology and a course in organic chemistry; senior standing. FRAENKEL.

324. **Insect Physiology.** II; 5 hours, or 1 unit. Prerequisite: A course in internal morphology and a course in organic chemistry; senior standing. FRAENKEL.

# FOOD TECHNOLOGY

## (Including Dairy Technology)

*Professors:* L. B. HOWARD (Head of Department), E. O. HERREID, P. H. TRACY.

*Associate Professors:* A. I. NELSON, Z. J. ORDAL, S. L. TUCKEY, R. M. WHITNEY.

*Assistant Professors:* L. L. KEMPE, F. A. KUMMEROW.

*Instructors:* O. W. KAUFMANN, J. TOBIAS.

*Assistants:* G. R. ABBENHAUS, J. A. BROTSOS, S. S. CHANG, J. E. CONRAD, R. G. GARNER, H. M. HICKMAN, C. J. HONER, W. J. HOOVER, K. H. HU, G. A. JACOBSON, D. E. MILLER, G. K. MURTHY, W. W. NAWAR, K. M. SHAHANI, M. P. STEINBERG.

## FOOD TECHNOLOGY

### Courses for Advanced Undergraduates

201. **Elements of Food Technology.** Lectures, reference readings, and demonstrations on the preservation and manufacture of food products of all types. I; 3. Prerequisite: Chemistry 133; Physics 101 and 102. HOWARD.

202. **Elements of Food Technology.** Lectures, reference readings, and demonstrations on the preservation and manufacture of food products of all types. II; 3. Prerequisite: Food Technology 201. HOWARD.

206. **Inspection Trip.** Inspection of typical examples of food preservation and manufacturing plants. A three- to four-day trip required of all seniors in food technology. Estimated expense, $35. II; no credit. Prerequisite: Senior standing in food technology or registration in Chemistry 329. STAFF.

269. **Raw Materials for Processing.** Same as Horticulture 269. Lectures, reference readings, and laboratory work with fruits and vegetables important to the food processing industry. I; 3. Prerequisite: Botany 100, or equivalent. LOTT, MCCOLLUM.

270. **Raw Materials for Processing.** Same as Agronomy 270. Lectures, reference readings, and laboratory work on cereal grains and oilseeds important to the food processing industry. Local field trips to grain and oilseed storage elevators or mills. II; 3. Prerequisite: Botany 100, or equivalent. DUNGAN.

### Courses for Advanced Undergraduates and Graduates

301. **Food Processing.** Lectures, discussions, and pilot plant demonstrations and experiments in preservation of foods by canning, freezing, dehydrating, and fermenting methods. Evaluation of product quality by subjective and objective methods and consideration of factory quality control factors. Field trips to commercial food plants. I; 4 hours, or 1 unit. Prerequisite: Food Technology 201, or equivalent. NELSON.

302. **Food Processing.** Lectures, discussions, and pilot plant demonstrations and experiments in food manufacture including formulation of food preparations from fruits, vegetables, and cereals; preservation of meats, fish, and poultry products; and extraction and refining of vegetable oils. Evaluation of product quality by subjective and objective methods and consideration of factory quality control factors. Field trips to commercial food plants. II; 4 hours, or 1 unit. Prerequisite: Food Technolgy 202 and 301, or equivalent. NELSON.

332. **Principles of Sanitation in the Processing and Handling of Foods.** Same as Veterinary Pathology and Hygiene 332. A study of the principles of sanitation with appropriate emphasis on practical considerations as they apply to various food processing industries. Control of insects, rodents, and microorganisms; fundamentals of detergency; sanitation of water supplies; waste disposal methods. Government and public health regulations. Local field trips to food processing plants. II; 4 hours, or 1 unit. Prerequisite: Bacteriology 104 and Chemistry 132, or equivalent. ORDAL.

363. **Unit Operations in Food Technology.** Same as Chemical Engineering 363. Fundamentals of heat transfer, fluid flow, extraction, drying, and other unit operations especially adapted to the food and biochemical industries. Primarily for students in chemistry and food technology; not open to majors in chemical engineering. Lectures and problems. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 240 or 247; one year of calculus. FINN.

373. **Advanced Food Microbiology.** A study of those foods, food processes, or food ingredients, the production of which involves the biological or enzymatic activities of bacteria, yeasts, or the higher fungi. I; 5 hours, or 1¼ units. Prerequisite: Bacteriology 308 and Chemistry 133, or equivalents. ORDAL.

## DAIRY TECHNOLOGY

### Courses for Undergraduates

101. **Introduction to Dairy Technology.** Development of the dairy industry in the United States and Illinois. The constituents of milk and factors affecting the chemical composition of milk. Nutritive value of milk. Laboratory procedures used in the operation of dairy manufacturing plants. I; 3. Prerequisite: Chemistry 101 or 102, and 105. TUCKEY.

103. **Dairy Products Judging.** Judging market grades of milk and cream. I; 1. HERREID.

104. **Dairy Products Judging.** Judging market grades of condensed milk, butter, cheese, ice cream, and powdered milk. II; 1. HERREID.

### Courses for Advanced Undergraduates

201. **Special Problems in Dairy Technology.** I, II; 5. Prerequisite: Senior standing; approval of head of department. TRACY.

### Courses for Advanced Undergraduates and Graduates

301. **Ice Cream Manufacture.** Technical problems and methods involved in the manufacture of commercial ice cream, sherbets, and ices. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TOBIAS, TRACY.

302. **Creamery Butter Manufacture.** Preparation of cream, churning, and packaging of butter. II; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TUCKEY.

303. **Cheese Manufacture.** Manufacture and ripening procedures for domestic and foreign types of cheese. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TUCKEY.

304. **Market Milk.** Production, quality control, assembling, and processing of fluid milk and related products. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. HERREID.

306. **Condensed Milk and Milk Powder Manufacture.** Methods of manufacturing different types of condensed and dried milks. II; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TOBIAS, TRACY.

308. **Plant Management.** Problems in the organization, financing, labor management, and operation of dairy plants. II; 3 hours, or ½ unit. Prerequisite: Senior standing in dairy technology. TRACY.

# FORESTRY

*Professor:* J. N. Spaeth (Head of Department).

*Associate Professors:* W. R. Boggess, L. B. Culver, R. W. Lorenz, C. S. Walters.

*Assistant Professor:* R. G. Rennels.

*Instructors:* W. F. Bulkley, H. W. Fox, B. F. Kent, D. A. Kulp, J. C. Van Camp, Jr.

*Assistants:* G. R. Cunningham, G. E. Massie.

## Courses for Undergraduates

**101. General Forestry.** The forest as a renewable natural resource; the aims and scope of forestry; economic and social importance of forests to the nation; the principal forest regions and species; forests for timber supply, for water conservation, for recreation, and for wild life; the principles of forest management and protection; the development of public and private forestry in the United States; forestry as a profession. I, II; 3. Prerequisite: Enrollment in preforestry curriculum, or sophomore standing. Rennels, Spaeth.

**102. Farm Forestry.** This course should be particularly helpful for those preparing for work in agricultural extension, soil conservation, and teaching vocational agriculture. A study of those phases of forestry which are applicable on Illinois farms. Includes identification of the principal trees; identification, properties, and uses of common woods; harvesting and marketing of principal products of farm woodlands; preservative treatment of farm timbers; measurement of logs, trees, and stands; determination of growth rate and value; life history of the forest and silvicultural handling of woodlands including the care of growing forests and the selection of trees for harvest; natural reproduction of forests and tree planting for wood products, erosion control, and windbreaks; protection of woodlands; place of farm woodlands in the agricultural economy; public aids to woodland owners; and educational programs for youth and adults. I, II; 3. Prerequisite: Enrollment in the College of Agriculture, College of Education, or consent of instructor. Rennels, Spaeth.

# FRENCH

### (Including Russian)

*Professors:* J. F. Jackson (Head of Department), D. H. Carnahan (Emeritus), C. A. Knudson.

*Associate Professors:* C. C. Gullette, P. E. Jacob, J. R. Smiley.

*Assistant Professors:* P. Kolb, Angelina R. Pietrangeli, Frances F. Sobotka, C. P. Viens.

*Instructors:* R. E. Hallowell, B. H. Mainous, F. W. Nachtmann, G. M. Oudyn.

*Assistants:* J. Alexander (on leave), Patricia C. Annable, T. E. Comfort, Monique Godefroy, Roberta R. Harrison, J. Kempers, J. P. Minn, M. K. Myers, Elaine F. Newkirk, R. E. Oliver, Margie L. Peters, E. G. Porter, Cordelia Reed, Natasha Toman.

## Requirements for L.A.S. Students

**Major:** Twenty hours of French excluding French 101, 102, 103, and 113, and including at least five hours from the group for advanced undergraduates and graduates.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject if two are chosen: education, English (excluding Rhetoric 101 and 102), German, Greek, history, Italian, Latin, medieval civilization studies, philosophy, Portuguese, and Spanish.

## Courses for Undergraduates

**101. Elementary Course.** Grammar, pronunciation, reading of modern authors, composition, and conversation. For students who have had no work in French. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation for French 101 without 102. MAINOUS and others.

**102. Elementary Course.** Continuation of French 101. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: French 101, or one year of high school French. STAFF.

**103. Modern French.** Rapid reading of modern authors, syntax, and composition. I, II; 4. Prerequisite: French 102, or two years of high school French. GULLETTE and others.

**104. Modern French.** Continuation of French 103. I, II; 4. Prerequisite: French 103, or three years of high school French. STAFF.

**113. Conversational Practice.** Oral practice for the development of elementary conversational skill and the improvement of pronunciation. Designed as a supplement to French 103 and 104, and open only to students concurrently enrolled in either French 103 or 104. I, II; 1. Prerequisite: French 102, or two years of high school French. KOLB, MAINOUS.

## Courses for Advanced Undergraduates

**201. Introduction to French Literature.** I, II; 3. Prerequisite: French 104, or four years of high school French. GULLETTE, HALLOWELL, JACOB, KOLB.

**202. Introduction to French Literature.** I, II; 3. Prerequisite: French 104, or four years of high school French. GULLETTE, HALLOWELL, JACOB, KOLB.

**211. Oral French.** Conversational practice for the development of oral facility. Training in pronunciation and diction. I, II; 2. Prerequisite: French 104, or 103 and 113. HALLOWELL, KOLB, VIENS.

**212. Oral French.** Continuation of French 211. I, II; 2. Prerequisite: French 211. HALLOWELL, KOLB, VIENS.

**213. Composition.** Training in writing French; translation from English and free composition. I; 2. Prerequisite: French 104. KNUDSON.

**214. Composition.** Continuation of French 213. II; 2. Prerequisite: French 213. KNUDSON.

**215. Advanced Conversation.** Conversational practice on a more advanced level than in French 211 and 212. I; 2. Prerequisite: French 212. VIENS.

**216. Advanced Conversation.** Continuation of French 215. II; 2. Prerequisite: French 215. VIENS.

**281. Methods of Teaching French.** Discussions and laboratory work in phonetics. I; 3. Prerequisite: Twenty hours in French, or sixteen hours in French and twenty hours in Spanish; senior standing, or consent of instructor. GULLETTE.

**291. Thesis and Honors.** For candidates for honors in French and for other seniors. I; 2. STAFF.

**292. Thesis and Honors.** For candidates for honors in French and for other seniors. II; 2. STAFF.

## Courses for Advanced Undergraduates and Graduates

**309. Survey of French Literature.** I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACKSON.

**310. Survey of French Literature.** II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACKSON.

317. **Modern French Drama.** I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. VIENS.

318. **Modern French Drama.** II; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. VIENS.

323. **French Drama of the Seventeenth and Eighteenth Centuries.** I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. KOLB.

324. **French Drama of the Seventeenth and Eighteenth Centuries.** II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. KOLB.

331. **French Novel of the Nineteenth Century.** From Balzac to Proust. I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACOB.

332. **French Novel of the Nineteenth Century.** From Balzac to Proust. II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACOB.

333. **Littérature Contemporaine.** In French. Modern poetry from Baudelaire to Valéry; prose writers from 1900 to 1940. I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1951-1952 and in alternate years. JACOB.

334. **Littérature Contemporaine.** In French. Modern poetry from Baudelaire to Valéry; prose writers from 1900 to 1940. II; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1951-1952 and in alternate years. JACOB.

335. **Civilisation Française.** In French. I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1952-1953 and in alternate years. JACKSON.

336. **Civilisation Française.** In French. II; 2 hours or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1952-1953 and in alternate years. JACKSON.

## RUSSIAN

### Courses for Undergraduates

101. **First Year Russian.** Reading, writing, oral-aural practice, elements of grammar. I; 4. Prerequisite: Sophomore standing. KEMPERS, SOBOTKA.

102. **First Year Russian.** Continuation of Russian 101. II; 4. Prerequisite: Russian 101. KEMPERS, SOBOTKA.

### Courses for Advanced Undergraduates

203. **Second Year Russian.** Reading; oral-aural practice; systematic, functional grammar. I; 4. Prerequisite: Russian 102, or equivalent. SOBOTKA.

204. **Second Year Russian.** Continuation of Russian 203. II; 4. Prerequisite: Russian 203. SOBOTKA.

205. **Reading in Scientific Russian.** Reading of Russian texts in the physical and social sciences. Designed for students who desire to achieve competence in reading Russian scientific material in their subject field. I; 4. Prerequisite: Russian 101 and 102; junior or senior standing. Offered in 1951-1952 only. SOBOTKA.

206. **Reading in Scientific Russian.** Reading of Russian texts in the physical and social sciences. Designed for students who desire to achieve competence in reading Russian sicentific material in their subject field. II; 4. Prerequisite: Russian 101 and 102; junior or senior standing. Offered in 1951-1952 only. SOBOTKA.

# GENERAL ENGINEERING DRAWING

*Professors:* R. P. HOELSCHER (Head of Department), S. G. HALL, H. H. JORDAN, F. M. PORTER (Emeritus), C. H. SPRINGER, L. D. WALKER.

*Associate Professors:* B. O. LARSON, J. E. PEARSON, S. H. PIERCE.

*Assistant Professors:* R. P. BORRI, R. S. CROSSMAN (Emeritus), E. D. EBERT.

*Instructors:* H. J. BOKENKAMP, J. S. DOBROVOLNY, A. G. FRIEDERICH, T. C. HARTLEY, R. D. HENSON, H. C. NELSON, W. L. SHICK, GRACE WILSON.

## Courses for Undergraduates

**101. Elements of Drawing.** Lettering; orthographic projection; working drawings; chart and diagram drawing; isometric and oblique drawing; freehand sketching; tracings; methods of reproducing drawings. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Plane geometry. HALL and others.

**102. Descriptive Geometry.** Theory of projections; solution of theoretical and practical problems involving size, shape, and relative position of common geometrical magnitudes such as points, lines, planes, curved surfaces, and solids; intersections, developments, shades and shadows, perspective drawing. I, II; 4. Prerequisite: Plane and solid geometry. LARSON and others.

**103. Aircraft Drafting and Lofting.** Aircraft terminology, control and reference surfaces and systems; sheet metal terminology and fabrication; drafting standards and types of drawings; drafting room manuals and standard handbooks; descriptive geometry applied to simple layouts and details; aircraft fastenings; lofting—plane, tapered, and double curved surfaces, airfoils, intersections; practices and standards. I, II; 3. Prerequisite: General Engineering Drawing 101 and 102. FRIEDERICH and others.

**104. Advanced Drawing.** Review of orthographic projection and working drawings; isometric, oblique, chart and diagram, topographical, architectural, and structural drawings. I, II; 4. Prerequisite: General Engineering Drawing 101, or equivalent. EBERT and others.

**105. Elements of Drawing.** For students in aircraft maintenance. Lettering, orthographic projection, dimensioning, development, process, and other symbols. I, II; 3. Prerequisite: Plane geometry.

**106. Elements of Drawing.** Lettering; orthographic projection; working drawings; chart and diagram drawing; isometric and oblique drawings; freehand sketching; tracings; methods of reproducing drawings, piping, perspective, and structural drawing. For students in chemical engineering. I, II; 3. Prerequisite: Plane Geometry. WALKER and others.

**107. Architectural Projections.** Instrumentation; lettering, projection; intersections; conventions; shades and shadows; perspective drawing. For students in architecture. I, II; 2. Prerequisite: Plane Geometry. SHICK, WILSON, and others.

**108. Architectural Projections.** Shades and shadows; oblique, isometric, and perspective drawing; developments. For students in architecture. I, II; 2. Prerequisite: General Engineering Drawing 107. SHICK, WILSON, and others.

## Courses for Advanced Undergraduates

**205. Applied Descriptive Geometry in Geological Problems.** For students majoring in geology. Lettering; orthographic projection; simple working drawings; signs and symbols used in geology; applied isometric and oblique projection; principles of descriptive geometry with special applications to geology. I, II; 3. Prerequisite: Plane geometry, physical geology (Geology 101), historical geology (Geology 102), or equivalent. DOBROVOLNY and others.

**210. Industrial Production Illustration.** Mechanical and freehand drawings in axonometric, oblique, and perspective; shades and shadows; rendering of drawings with various media including some work with the airbrush; industrial production illustra-

tion. An approved elective in all engineering curricula. I, II; 3. Prerequisite: General Engineering Drawing 102, or 107 and 108. SPRINGER and others.

212. **Graphical Calculations.** Use of various types of slide rules with special attention to the log-log scales; rectification of curves from laboratory data to devise empirical equations using various types of coordinate paper; construction and use of nomographs or alignment charts. For students in engineering; accepted as an approved elective in all engineering curricula. I, II; 1. Prerequisite: General Engineering Drawing 101, or equivalent; Mathematics 112, 114, and 122. PIERCE and others.

## GEOGRAPHY

*Professors:* J. A. RUSSELL (Head of Department), W. O. BLANCHARD, J. H. GARLAND, J. L. PAGE.

*Associate Professors:* A. W. BOOTH, F. W. FOSTER.

*Assistant Professor:* R. L. CARMIN.

*Instructor:* J. D. FELLMANN.

### Requirements for L.A.S. Students

**Major:** Twenty hours in geography in addition to Geography 101, including Geography 371 and at least five hours of courses not open to freshmen. All students electing to major in geography must have had Geography 101 and one of the following: Geography 111 (Introductory Meteorology), 104 (World Regional Geography), 105 (Introductory Economic Geography), or their equivalents. In addition, work in the following fields in geography is recommended: climatology, map construction and map use, field work, advanced economic geography, and the regional geography of at least two major areas of the world, one of which must be in North America. Students are expected to take work outside the department in physical or biological science, social science, statistics, expository writing, principles of effective speaking, and at least one modern foreign language.

**Minors:** Twenty hours chosen from one or two of the following subjects: agricultural economics, agronomy, architecture, botany, economics, education, French, geology, German, history, journalism, landscape architecture, library science, marketing, mathematics, political science, Portuguese, sociology and anthropology, Spanish and Italian, and zoology. At least eight hours must be taken in each subject if two are chosen. The curriculum on international affairs and the Latin American studies program will be accepted as minors.

**Honors:** Only those students who have four hours credit in Geography 371 and 372 and write a thesis will be recommended for graduation with honors.

### Courses for Undergraduates

101. **Elements of Geography.** The geographic point of view; elements of the physical landscape; planetary relations, weather, climate, climatic regions, land-forms, natural resources. Lectures and quiz. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. BOOTH and others.

104. **World Regional Geography.** Survey of the geographic structure of the world; regional patterns of settlement and land utilization; man's occupancy of the world. Lectures and quiz. II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Geography 101 or consent of instructor. GARLAND and others.

105. **Introductory Economic Geography.** Man's utilization of the major economic resources of the world from the standpoint of geographic patterns. Primarily for commerce students but open to others. Lectures and quiz. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. CARMIN and others.

111. **Introductory Meteorology.** The atmosphere; its composition, functions, and behavior in the production of various weather types; air masses; application to present-day activities. Lectures and quiz. I, II; 3. Prerequisite: Geography 101 or consent of instructor. PAGE and others.

**114. Conservation of Natural Resources.** Regional aspects of the conservation of natural resources (soils, water, biotic, mineral, recreational) with special emphasis on the United States. II; 3. Prerequisite: Sophomore standing. BOOTH.

**123. Geography of Illinois.** Detailed regional study of the state with special emphasis on the cultural relations of Illinois to the rest of the nation. I; 3. Prerequisite: Geography 101, 104, or consent of instructor. GARLAND.

**162. Manufacturing Regions of the World.** A description of each of the major manufacturing regions of the world. Each region is analyzed in terms of the geographic conditions which have influenced its location and its products. I; 3. Prerequisite: Sophomore standing. RUSSELL.

**179. Teaching of Geography.** Review of fundamental factual material; teaching devices; selection of equipment, including texts for upper grade and high schools. S; 2½. Prerequisite: Sophomore standing or teaching experience. BLANCHARD.

## Courses for Advanced Undergraduates

**211. Agricultural Climatology.** Climatic elements and controls. Types of climate, graphic and cartographic representation of climatic data. Macro and micro climates in relation to agriculture. II; 3. PAGE.

**221. Geography of Western North America.** Occupance patterns of Anglo-America; regions of western United States, Canada, and Alaska; national and international relations of western North America. I; 3. Prerequisite: Eight hours of geography. Offered in 1952-1953 and in alternate years. GARLAND.

**222. Geography of Eastern North America.** Occupance patterns of Anglo-America; regions of eastern United States and Canada; eastern North America as the core of two continental nations. II; 3. Prerequisite: Eight hours of geography. Offered in 1951-1952 and in alternate years. GARLAND.

**231. Geography of Caribbean America.** Physical and cultural landscapes of geographic regions of Mexico, Central America, northern South America, and the West Indies. I; 3. Prerequisite: Junior standing; eight hours of geography, or enrollment in the Latin American studies program. CARMIN.

**232. Geography of South America.** Physical and cultural landscapes of geographic regions of the southern hemisphere; countries of South America. II; 3. Prerequisite: Junior standing; eight hours of geography, or enrollment in the Latin American studies program. CARMIN.

**272. Introductory Field Geography.** The application of fundamental geographical field techniques to field mapping. This course is designed to develop field mapping skills, to permit practical application of geographical principles, and to provide a basic understanding of field procedures introductory to advanced field geography for the student who later seeks an advanced degree. S; 5 to 8 (depending on duration of camp). Prerequisite: Eleven hours of geography. STAFF.

## Courses for Advanced Undergraduates and Graduates

**313. Climates of the Continents.** A regional treatment of the climates of the world by continents. I; 3 hours, or ½ unit. Prerequisite: Geography 101 and 111. PAGE.

**342. Geography of Europe.** Influence of climate, surface features, and natural resources on the distribution of the people, their industries, and routes of trade. New boundaries and present economic problems in their geographic setting. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography or enrollment in the Russian studies program. BLANCHARD.

**351. Geography of Asia.** A regional geography of Asia with concentration on the monsoon realm of southern and eastern Asia. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography or enrollment in the Russian studies program. Offered in 1951-1952 and in alternate years. BOOTH.

353. **Geography of the U.S.S.R.** Physical and cultural regionalism; a survey of natural resources and patterns of human occupance including industry, agriculture, and transportation. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography or enrollment in the Russian studies program. FELLMANN.

361. **Land Utilization.** A geographic consideration of the nature of land utilization from the world, continental, and regional viewpoints. Special emphasis will be placed upon geographic techniques of land inventory, methods of land classification, and the detailed investigation of land utilization in this country and abroad. I; 3 hours, or ½ unit. FOSTER.

363. **Production of Great World Minerals.** Geographic aspects of the mineral industries. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography. BLANCHARD.

365. **Geographic Aspects of Transportation.** Geographic factors influencing transportation by land, sea, and air. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography. BLANCHARD.

366. **Problems of Industrial Location.** The relationship between geographic facts of relief, climate, resources, population, and transportation and the industrial location process. Case studies in the effects of transportation networks and rates, sources of materials, labor supply, location of markets, etc. on the selection and evaluation of industrial sites. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography; three hours of economic geography for commerce students. Engineering and architecture students may register with permission of the instructor. RUSSELL.

371. **Introduction to Research.** Limited to seniors and graduates whose major is geography, and to seniors whose major is in other departments who have twelve hours of geography, including three hours in a regional course. I; 2 hours, or ½ unit. STAFF.

372. **Introduction to Research.** Limited to seniors and graduates whose major is geography, and to seniors whose major is in other departments who have twelve hours of geography, including three hours in a regional course. II; 2 hours, or ½ unit. STAFF.

373. **Map Compilation and Construction.** Laboratory instruction and practice in the basic techniques of map making followed by a consideration of problems involved in the construction of maps for presentation in a reproduced form (i.e., printed, photographed). Included are the selection of proper source materials for the base and body of the map, the compilation and correlation of these materials, and methods of mechanical and photographic reproduction. I; 4 hours, or 1 unit. Prerequisite: Consent of instructor. FOSTER.

375. **Map Reading and Interpretation.** Evaluation of map components, map reading, map interpretation, map history, and survey of world maps and mapping. I; 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor. BOOTH.

376. **Field Geography.** Techniques and methods of field investigation; reconnaissance and unit area mapping; collection and use of field data; organization and presentation of material. Field trips limited to the local area. II; 3 hours, or ½ unit. Prerequisite: A declared major in geography. FOSTER.

378. **Descriptive Interpretation of Aerial Photographs.** Reading and interpreting of aerial photographs; their potentialities and limitations as a research tool of geography. II; 2 hours, or ½ unit. Prerequisite: Consent of instructor. BOOTH.

383. **Urban Geography.** The distribution, functions, and internal structure of cities; a geographic analysis and classification of urban centers and their tributary areas. I; 4 hours, or 1 unit. Prerequisite: Eight hours of geography, or consent of instructor. FELLMANN.

386. **Political Geography.** World patterns of nations in relation to their natural environmental backgrounds. European nations; Africa, the exploited continent; national structures in Asia; western hemisphere nations. I; 3 hours, or ½ unit. Prerequisite: eight hours of geography. Majors or graduate students in political science or history may enroll with consent of the instructor. GARLAND.

# GEOLOGY

*Professors:* G. W. White (Head of Department), C. A. Chapman, F. W. DeWolf (Emeritus), R. E. Grim, J. L. Hough, H. W. Scott, H. R. Wanless.

*Associate Professors:* A. F. Hagner, B. Kummel, P. R. Shaffer.

*Instructors:* D. M. Henderson, W. M. Merrill.

*Assistants:* D. H. Amos, H. W. Arms, C. A. Barton, R. S. Boardman, E. E. Glick, C. H. Hardie, J. C. Hathaway, M. L. Kidda, R. F. McAllister, W. L. McCormick, Jacqueline W Patterson, D. A. Robertson, L. G. Schultz, R. B. Scott, J. W. Shelton, V. C. Shepps, M. Silverman, N. F. Sohl, F. L. Staplin, H. G. Stewart, E. W. Tooker, J. P. Wehrenberg, E. G. Williams.

## Requirements for L.A.S. Students

**Major:** Twenty hours in geology, excluding Physical Geology 101, Agricultural Geology 105, and Geology for Engineers 150, and including at least five hours of courses not open to freshmen or sophomores. The following courses, in addition to Physical Geology 101, are fundamental for a major in geology; Historical Geology 102, Mineralogy 131 and 132, Geomorphology 301, Structural Geology 311, Paleontology 320, Stratigraphy 321, Field Methods 315, General Engineering Drawing 205, General Chemistry 101 or 102, General Physics 101, College Algebra 112, and Trigonometry 114.

Students planning to make geology their major subject are strongly advised to take General Surveying, Civil Engineering 115, or equivalent. The following courses are also recommended for all whose primary interest is in mineralogy, petrology, and economic geology: Analytic Geometry, Mathematics 122; General Physics 102; Qualitative Analysis 105; and Elementary Physical Chemistry 240, or equivalent.

**Minors:** Twenty hours chosen from one or two of the following subjects: astronomy. botany, chemistry, economics, geography, mathematics, physics, zoology, mining engineering, and civil engineering, after consultation with the Department of Geology. At least eight hours must be taken in each subject, if two are chosen.

**Honors:** Only those students who have four hours credit in Geology 290 or 291 and write a thesis will be recommended for graduation with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration.

Note: Certain geology courses are offered only in alternate years: Geology of Illinois 319, Paleobotany 325.

At least one year of graduate work is very desirable as further training for all professional work in geology.

## Courses for Undergraduates

**101. Physical Geology.** Materials, structures, surface features of the earth and processes which have produced them. Lectures, quiz, and laboratory. One-half day field trip required. Geology 101 and 102 meet the general education requirement in the physical sciences in the College of Liberal Arts and Sciences. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Shaffer, White, and others.

**102. Historical Geology.** Evolution of the earth and its life. Lectures and laboratory. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Geology 101, or Division of General Studies 141. Kummel, Scott.

**105. Agricultural Geology.** Principles of physical geology with emphasis on those useful to students of agriculture. For agriculture students only. I, II; 3. Prerequisite: One semester of chemistry. Shaffer and others.

**110. Field Work.** Field observations in southern Indiana, eastern Kentucky and Tennessee, including visits to the Great Smoky Mountains, the Cumberland Gap region, and Mammoth Cave. II; 2. Credit will be given only on completion of a satisfactory written report. Prerequisite: Geology 101, 105, 150, or Division of General Studies 141; consent of instructor. Shaffer.

130. **Mineralogy for Engineers.** Elementary crystallography and minerals of economic and scientific importance. I, II; 3. Prerequisite: One semester of college chemistry. HENDERSON and others.

131. **Mineralogy.** A systematic study of minerals and common rocks. Lecture and laboratory I; 3. Prerequisite: One semester of college chemistry. HENDERSON and others.

132. **Mineralogy.** Continuation of Geology 131. Lecture and laboratory. II; 3. Prerequisite: Geology 131. HENDERSON and others.

150. **Geology for Engineers.** I, II; 3. Prerequisite: Sophomore standing in the College of Engineering. HOUGH and others.

## Courses for Advanced Undergraduates

246. **Applied Petroleum Geology.** Primarily for students in the College of Engineering. I; 3. Prerequisite: Geology 150, or consent of head of department.

247. **Applied Petroleum Geology.** Continuation of Geology 246. Primarily for students in the College of Engineering. II; 3. Prerequisite: Geology 150, or consent of head of department.

290. **Introduction to Research.** Limited to seniors whose major is geology, and mechanical engineering students who take Geology 246 and 247. Required of geology majors graduating with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration. Only those students who have four hours credit in Geology 290 and 291 and who write a thesis will be recommended for graduation with honors. I; 2. STAFF.

291. **Introduction to Research.** Limited to seniors whose major is geology and mechanical engineering students who take Geology 246 and 247. Required of geology majors graduating with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration. Only those students who have four hours credit in Geology 290 and 291 and who write a thesis will be recommended for graduation with honors. II; 2. STAFF.

## Courses for Advanced Undergraduates and Graduates

301. **Geomorphology.** The study of the history, origin, and characteristics of land forms produced by fluvial, glacial, wind, and wave erosion or by a combination of these, acting upon the major kinds of geologic materials and structures. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102. WHITE.

311. **Structural Geology.** Rock deformation and its results. Lectures, laboratory, and field trip. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102.

315. **Field Methods.** Mapping of an area in southern Illinois. Lecture, quiz, and field trips. II; 3 hours, or ½ unit. Credit will be given only on completion of a satisfactory written report. Prerequisite: Geology 102. WANLESS.

316. **Field Geology.** Geology of the Baraboo, Wisconsin, region. A field course covering structural, stratigraphic, glacial, and physiographic features. The emphasis is on methods of study and interpretation. A comprehensive report is required in order to provide training in geological report writing. Field trip scheduled for August 22 to September 9, 1951. Estimated travel expense, $40. S; 4 hours, or 1 unit. Prerequisite: Geology 102, or equivalent; consent of instructor. HOUGH.

317. **Geology of San Juan Region, Colorado.** Field course to be conducted from campus of Fort Lewis Agricultural and Mechanical College near Durango, Colorado. Field training in stratigraphy, structure, and geomorphology. Geologic mapping with plane table and aerial photographs. Scheduled for June 25 to August 19, 1951. Estimated expense, $235 to $255. S; 8 hours, or 2 units. Prerequisite: Geology 102; consent of instructor. WANLESS, MERRILL.

320. **Invertebrate Paleontology.** Fossil groups in biological sequence. Lectures and laboratory. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102. KUMMEL.

321. **Stratigraphy.** General stratigraphy, fossil faunas, with special reference to invertebrates and correlation. Emphasis is placed on physical history. I, II; 4 hours, or 1 unit. Prerequisite: Geology 320. SCOTT.

325. **Paleobotany.** Same as Botany 325. The structure, phylogeny, and geological distribution of representative fossil plants. Two or three field trips. II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 100 or Division of General Studies 131 and 132; Geology 101, or consent of instructor. Offered in 1952-1953 and in alternate years. STEWART.

335. **Optical Mineralogy.** Study of the optical properties of minerals and the use of the petrographic microscope. Emphasis is placed on the identification of minerals by the immersion method. Designed for students in geology, ceramics, chemistry, mining, and agriculture. I; 4 hours, or 1 unit. Prerequisite: Geology 132. CHAPMAN.

336. **Petrography.** Study of the constituents, composition, textures, structures, and classification of rocks. In the laboratory rocks are studied in hand specimen and thin section. Emphasis is placed on the ordinary methods of petrographical investigation. II; 4 hours, or 1 unit. Prerequisite: Geology 335. CHAPMAN.

351. **Geophysics of Mining.** Same as Mining Engineering 351. Principles of geophysics and their application to mining processes. I; 3 hours, or 1 unit. Prerequisite: Senior standing in engineering or geology, or consent of instructor. CHEDSEY.

## GERMAN

*Professors:* H. REHDER (Head of Department), J. T. GEISSENDOERFER, D. W. SCHUMANN, G. WATERHOUSE (first semester), C. A. WILLIAMS (Emeritus),

*Associate Professors:* J. R. FREY, F. J. NOCK, E. A. PHILIPPSON, H. STEGEMEIER.

*Assistant Professors:* DAISY L. BLAISDELL (Emerita), MIMI I. JEHLE.

*Instructors:* R. R. BREWSTER, W. GIESEKE, W. F. ROERTGEN, PAULINE STEINER.

*Assistants:* C. CARRIER, E. GOESSLING, C. W. HEIMRICH, L. HOLTSCHLAG, B. L. JENNINGS, J. KEMPERS, J. E. RYBERG, JR., W. ST. CROIX, ELIZABETH SANDS, R. S. SEARS, BEATRICE STERNBERG, CHARLOTTE S. STREISINGER.

### Requirements for L.A.S. Students

**Major:** Twenty hours in German excluding courses 101, 102, 103, and 113, and including at least six hours in courses in the 300 group, or equivalent.

**Minors:** Twenty hours in not more than two subjects chosen from the following list, with at least eight hours in each subject: education, English (excluding Rhetoric 101 and 102), French (excluding 101), Greek, history, Italian, Latin, philosophy, Portuguese, and Spanish (excluding 101). The Department of German accepts as a minor the course program in medieval studies sponsored by the Division of the Humanities.

### Courses for Undergraduates

101. **Elementary Course.** Oral practice, reading, and grammar for beginners. Not open to students who have had high school credit in this language. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for German 101 without German 102. STAFF.

102. **Elementary Course.** Continuation of German 101. Oral practice, reading, and grammar. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: German 101, or one year of high school German. STAFF.

103. **Intermediate Course.** Modern narrative prose. Oral practice and sight reading. I, II; 4. Prerequisite: German 102, two years of high school German, or equivalent. STAFF.

104. **Intermediate Course.** Continuation of German 103. Literary reading. Classical and modern narrative prose. Oral practice and sight reading. I, II; 4. Prerequisite: German 103, three years of high school German, or equivalent. STAFF.

113. **Practice in Conversation.** Oral practice for the development of elementary skill in conversation and the improvement of pronunciation. This course is supplementary to German 103 and 104. I, II; 2. Prerequisite: German 102, or two years of high school German; concurrent registration in German 103 or 104.

144. **Scientific Reading.** Rapid reading of scientific prose. Parallel with German 104. Students may not take both German 104 and 144 for a total of more than four hours credit without permission of the department. II; 4. Prerequisite: German 103, three years of high school German, or equivalent. STAFF.

## Courses for Advanced Undergraduates

210. **Masterpieces of German Literature.** Introduction into German literature, its subjects, forms, and ideals. I, II; 3. Prerequisite: German 104, 144, two years of college German, or equivalent. REHDER.

211. **Conversation and Writing.** I, II; 2. Prerequisite: German 104, or German 103 and 113, or equivalent. STEGEMEIER.

212. **Conversation and Writing.** Continuation of German 211. I, II; 2. Prerequisite: German 211, or equivalent, or consent of instructor. ROERTGEN, STEGEMEIER.

251. **Modern German Fiction.** I or II; 3. Prerequisite: German 210, or equivalent. WATERHOUSE.

252. **Modern German Drama.** A study of the drama of the nineteenth and twentieth centuries, its relation to the Greek drama and world drama. I or II; 3. Prerequisite: German 210, or equivalent. JEHLE.

260. **Lyrics and Ballads.** A poetical and metrical survey of German lyric verse from its beginning to modern times, with a critical analysis of representative poems. I or II; 3. Prerequisite: German 210, or equivalent. STEGEMEIER.

270. **Twentieth Century German Literature.** Introduction to trends of modern civilization as reflected in contemporary German literature. S; 3. Prerequisite: Two years of German, or equivalent, or consent of instructor. FREY.

281. **Teachers' Course.** An introduction into the problems of the teaching of German and a study of textbooks. I; 2. Prerequisite: Three years of college German, or equivalent. FREY.

291. **Senior Thesis and Honors Course.** Intended primarily for candidates for honors in German, but open to other seniors. I; 2. Prerequisite: Senior standing; three years of college German, or equivalent. STAFF.

292. **Senior Thesis and Honors Course.** Intended primarily for candidates for honors in German, but open to other seniors. II; 2. Prerequisite: Senior standing; three years of college German, or equivalent. STAFF.

## Courses for Advanced Undergraduates and Graduates

301. **German Literature to the Eighteenth Century.** I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. FREY.

302. **German Literature Since the Eighteenth Century.** II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. FREY.

303. **Advanced Composition and Syntax.** Intensive study of advanced problems of grammar, syntax, and style. I or II; 2 hours, or ½ unit. Prerequisite: Three years of college German, including German 212 or equivalent.

311. **Goethe.** Introduction to Goethe's life and works. I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1952-1953 and in alternate years. WATERHOUSE.

312. **Goethe's Faust.** Intensive study of Goethe's *Faust*, Parts I and II. II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1952-1953 and in alternate years. GEISSENDOERFER.

320. **History of German Civilization.** A selected topical, historical, and pictorial analysis of German culture and civilization. I or II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. STEGEMEIER.

331. **German Classics I.** Study of the works of Lessing, Herder, and Wieland. I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1951-1952 and in alternate years. GEISSENDOERFER.

332. **German Classics II.** Study of the works of Schiller, Kleist, Hölderlin, and Jean Paul. II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1951-1952 and in alternate years. SCHUMANN.

360. **Introduction to German Phonetics.** Study of the sounds of the German language and their transcription in the international phonetic alphabet. I; 2 hours, or ½ unit. Prerequisite: Senior standing; three years of German, or equivalent; consent of instructor. NOCK.

363. **Introduction to Comparative Literature.** Same as English 363. A comparative study of great books in Greek, Roman, Italian, and Spanish literature. I; 3 hours, or ½ unit. GOLDMAN, HAMILTON, HOLADAY, LANDIS, RAPP, VAN HORNE, WARREN.

364. **Introduction to Comparative Literature.** Same as English 364. A comparative study of great books in French, German, and English literature. II; 3 hours, or ½ unit. GOLDMAN, JACOB, LANDIS, RAPP, REHDER, WARREN.

## GREEK

(See Classics)

## HEALTH EDUCATION

(See Physical Education)

## HISTORY

*Professors:* F. C. DIETZ (Head of Department), R. G. BONE, P. V. B. JONES (Emeritus), C. E. NOWELL, J. G. RANDALL (Emeritus), W. S. ROBERTSON (Emeritus), F. S. RODKEY, F. A. SHANNON, R. P. STEARNS, J. W. SWAIN, R. C. WERNER.

*Associate Professors:* A. E. BESTOR, R. N. CURRENT, E. L. ERICKSON, C. G. STARR.

*Assistant Professors:* NATALIA M. BELTING, LOUISE B. DUNBAR, F. B. FREIDEL, AMEDA R. KING, MARY L. SHAY, J. B. SIRICH, K. W. SWART.

*Instructors:* W. J. BOUWSMA, C. E. DAWN, N. F. NORMAN, R. M. SUTTON.

*Assistants:* E. BOLD, C. M. CARPENTER, MARION S. CAUSEY, W. L. HEYMEYER, V. HICKEN, A. Q. LARSON, G. H. LOBDELL, A. C. MILLER, P. I. MITTERLING, R. C. PUGH, E. A. REITAN, E. W. SIGMUND, D. F. TINGLEY, S. J. TONSOR.

### Requirements for L.A.S. Students

**Major:** Twenty hours in history, including ten hours in courses having junior standing as a prerequisite, and any other courses offered by the department except courses taken in the first year.

**Minors:** Twenty hours (excluding courses taken in the first year) selected from one or two of the following subjects: economics, English and American literature, geography, law, philosophy, political science, and sociology. Courses in one ancient or modern language (except such as are primarily designed for freshmen) will be accepted as one of the two minor subjects. The curriculum on international affairs will be accepted as a minor.

## Courses for Undergraduates

101. **Introduction to General Social Sciences.** A survey of the principal political, economic, and social ideas and institutions as they have developed in the civilizations of ancient Greece and Rome, medieval Europe and modern Europe. I, II; 3.

111. **Modern European History from the Renaissance to 1815.** Europe from the age of the great discoveries to the close of the Napoleonic Wars. I; 4. Students with 95 or more credit hours receive only 3 hours credit. NORMAN, STEARNS.

112. **Modern European History, 1815 to the Present.** Development of European nationalism, liberalism, and imperialism; World War; reconstruction. II; 4. Students with 95 or more credit hours receive only 3 hours credit. NORMAN, STEARNS.

131. **History of England to 1688.** History of the British peoples to 1688. I; 3. Students with 95 or more credit hours receive only 2 hours credit. ERICKSON.

132. **History of England, 1688 to 1951.** Modern history of the United Kingdom; colonial and imperial development. II; 3. Students with 95 or more credit hours receive only 2 hours credit. ERICKSON.

151. **History of the United States to 1865.** Colonial foundations, movement for independence, early years of the republic. I; 3. Prerequisite: Sophomore standing. DUNBAR, WERNER.

152. **History of the United States, 1865 to 1951.** A century of national life and organization. I, II; 3. Prerequisite: Sophomore standing. DUNBAR, KING, SUTTON, WERNER.

161. **Survey of American Civilization.** A course designed to fulfill the humanities requirement in general education. I; 4. Prerequisite: Sophomore standing.

162. **Survey of American Civilization.** A course designed to fulfill the humanities requirement in general education. II; 4. Prerequisite: Sophomore standing.

181. **The Ancient World.** Ancient empires and Greece. I; 3. Prerequisite: Sophomore standing. SWAIN.

182. **The Ancient World.** Rome. II; 3. Prerequisite: Sophomore standing. SWAIN.

## Courses for Advanced Undergraduates

209. **The Near East from Mohammed to Napoleon.** I; 2. Prerequisite: One year of college history; junior standing. DAWN.

210. **The Near East from Napoleon to the Present.** II; 2. Prerequisite: One year of college history; junior standing. DAWN.

250. **History of American Immigration.** Colonial and national periods. II; 2. Prerequisite: One year of college history; junior standing. WERNER.

290. **Teaching of History.** II; 2. Prerequisite: One year of college history; senior standing. WERNER.

291. **History of Land Warfare.** I; 3. Prerequisite: One year of college history; junior standing. STARR.

292. **History of Naval Warfare.** II; 3. Prerequisite: One year of college history; junior standing. STARR.

293. **Thesis.** Special training in historical investigation. I; 2 to 4. Prerequisite: Senior standing. STAFF.

294. **Thesis.** Special training in historical investigation. II; 2 to 4. Prerequisite: Senior standing. STAFF.

295. **Reading Course.** Reading in selected fields chosen in consultation with the instructor. I; 2 to 4. Open only to juniors and seniors of high standing. STAFF.

296. **Reading Course.** Readings in selected fields chosen in consultation with the instructor. II; 2 to 4. Open only to juniors and seniors of high standing. STAFF.

## Courses for Advanced Undergraduates and Graduates

301. **The Middle Ages, A.D. 400 to 1100.** Europe from the fall of Rome to the first crusade. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWART.

302. **The Middle Ages, A.D. 1100 to 1500.** Europe from the rise of towns to the establishment of national monarchy. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history SWART.

304. **Medieval Civilization.** Religious and intellectual. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. SWART.

305. **The Age of the Renaissance.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

306. **The Age of the Protestant and Catholic Reformation, 1500 to 1648.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

307. **Classical Islam: The Near East from Mohammed to the Crusades.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DAWN.

308. **The Europeanization of the Near East, 1768 to 1914.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DAWN.

309. **Development of Modern Europe: Absolutism and Colonial Expansion, 1648 to 1789.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SIRICH.

310. **Development of Modern Europe: The French Revolution and Napoleon, 1789 to 1815.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SIRICH.

311. **Europe from 1815 to 1860.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. SWART.

312. **Europe from 1860 to 1900.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. SWART.

313. **European History, 1900 to 1925.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. SHAY.

314. **European History, 1925 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. SHAY.

317. **History of Modern Italy, 1700 to 1830.** I; 2 hours, or ½ unit. Prerequisite: One year of college history. SHAY.

318. **History of Modern Italy, 1831 to the Present.** II; 2 hours, or ½ unit. Prerequisite: One year of college history or political science. SHAY.

319. **Tsarist Russia: Its Background, Expansion, and Problems to 1855.** A survey of what is basic in the cultural heritage of the Russian people and the Russian state up to the revolutionary era. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. RODKEY.

320. **Modern Russia and Its Problems, 1855 to the Present.** An analysis of the various currents and factors that have accounted for what is now dominant in the culture and organization of the Soviet Union. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. RODKEY.

322. **History of Spain and Portugal.** A survey of the Iberian Peninsula from the earliest times until the present. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in history. NOWELL.

323. **Science, Philosophy, and the Modern European Mind.** Intellectual history of modern Europe, 1543 to 1770. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing and one of the following: History 111 and 112, 131 and 132, Division of General Studies 121 and 122, English 111 and 112, or Philosophy 101. SIRICH, STEARNS.

324. **Science, Idealism, and Materialism.** Intellectual history of modern Europe, 1770 to 1914. II; 3 hours, or ½ to 1 unit. Prerequisite: History 323, or consent of instructor. SIRICH, STEARNS.

325. **Intellectual and Cultural History of Russia to 1881.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. RODKEY.

326. **Intellectual and Cultural History of Russia from 1881 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. RODKEY.

333. **The History of England from 1377 to 1485.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1951-1952 and in alternate years. DIETZ.

334. **The History of England under the Tudors, 1485 to 1603.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1951-1952 and in alternate years. DIETZ.

335. **Foundations of English and American Democratic Institutions, 1603 to 1689.** A study of the origins and practices of Anglo-American ideals and institutions. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. STEARNS.

336. **Foundations of English and American Democratic Institutions, 1689 to 1783.** A study of the maturation of American democratic ideals and institutions. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. STEARNS.

339. **History of the British Commonwealth in the Nineteenth and Twentieth Centuries, 1783 to 1870.** I; 2 hours, or ½ unit. Prerequisite: One year of college history, preferably History 131 and 132, though 111 and 112, and 151 and 152 satisfy the requirement. ERICKSON.

340. **History of the British Commonwealth in the Nineteenth and Twentieth Centuries, 1870 to the Present.** II; 2 hours, or ½ unit. Prerequisite: One year of college history, preferably History 131 and 132, though 111 and 112, and 151 and 152 satisfy the requirement. ERICKSON.

343. **Social and Economic History of England Since the Beginning of the Industrial Revolution.** Social and economic history of England, 1750 to 1848. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1952-1953 and in alternate years. DIETZ.

344. **Social and Economic History of England Since the Beginning of the Industrial Revolution.** Social and economic history of England since 1848. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1952-1953 and in alternate years. DIETZ.

345. **Constitutional History of England to 1485.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. DIETZ.

346. **Constitutional History of England from 1485 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. DIETZ.

349. **The Age of Discovery.** A survey of the history of discovery centering in the great discovery era of the fifteenth and sixteenth centuries, with a brief survey of earlier discovery and a continuation down to the twentieth century. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in alternate years. NOWELL.

352. **American Colonies in the Seventeenth and Eighteenth Centuries.** I; 3 hours, or ½ to 1 unit. WERNER.

354. **Foundations of American Society: The Transition to National Life and Organization, 1763 to 1789.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DUNBAR.

357. **Social and Economic History of the United States, 1775 to 1860.** The growth of American economic life and institutions from the Revolution to the outbreak of the Civil War. I; 3 hours, or ½ to 1 unit. Prerequisite: History 152. SHANNON.

358. **Social and Economic History of the United States Since 1860.** The growth of American economic life and institutions since 1860. II; 3 hours, or ½ to 1 unit. Prerequisite: History 152. SHANNON.

359. **The Civil War and Reconstruction.** Remote and immediate causes of the Civil War, especially from 1850 to 1861, problems of the North and South during the war; the consequences of the war; the efforts to create a new Union, 1865 to 1877, and the new problems created by those efforts. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SHANNON.

361. **History of the United States, 1877 to 1917.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. FREIDEL.

**362. History of the United States Since 1917.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. FREIDEL.

**363. History of the West, 1634 to 1774.** I; 2 hours, or ½ unit. Prerequisite: One year of college history. BELTING.

**364. History of the West, 1774 to 1830.** II; 2 hours, or ½ unit. Prerequisite: One year of college history. BELTING.

**365. History of Illinois from 1809 to the Present.** Evolution of a typical middle western commonwealth. I; 2 hours, or ½ unit. Prerequisite: One year of college history. SUTTON.

**369. Political and Constitutional Development of the United States to 1865.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. FREIDEL.

**370. Political and Constitutional Development of the United States Since 1865.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. FREIDEL.

**371. American Intellectual and Cultural History to 1877.** The contribution of social and political thought, religion, science, scholarship, and education to the history of American civilization. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BESTOR.

**372. American Intellectual and Cultural History Since 1877.** The contribution of social and political thought, religion, science, scholarship, and education to the history of American civilization. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BESTOR.

**373. Diplomatic History of the United States to the End of the Nineteenth Century.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. CURRENT.

**374. Diplomatic History of the United States in the Twentieth Century.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. CURRENT.

**375. History of Latin America to 1824.** A survey of Latin American history from the discovery of America until 1824. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. NOWELL.

**376. Latin America Since 1824.** A history of the Latin American republics from their independence to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: One course in college history. NOWELL.

**377. History of the A.B.C. Powers.** History of Argentina, Brazil, and Chile from their origins to the present. I; 3 hours, or ½ unit. Prerequisite: One course in history. Offered in 1952-1953 and in alternate years. NOWELL.

**378. History of the Caribbean Area.** A survey of the Caribbean, Mexico, and Central America from the discovery of America to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: One course in history. NOWELL.

**381. Ancient Greek States.** History of the Greek States from the earliest time to 334 B.C. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**382. Ancient Imperialism.** Alexander and his successors. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**383. Roman Republic.** History of the Roman Republic to 44 B.C. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**384. Ancient Imperialism.** The Roman Empire. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**391. History of Eastern Asia to 1839.** History of eastern Asia (China, Japan, and Korea) to 1839. I; 2 hours, or ½ unit. Prerequisite: One year of college history. WERNER.

**392. History of Eastern Asia Since 1839.** History of eastern Asia (China, Japan, and Korea) since 1839. II; 2 hours, or ½ unit. Prerequisite: One year of college history. WERNER.

# HOME ECONOMICS

*Professors:* Janice M. Smith (Head of Department), J. Lita Bane (on leave), Kathryn V. Burns, Nellie L. Perkins.

*Associate Professors:* Grace B. Armstrong, Harriet T. Barto, Fannie M. Brooks (Emerita), Mary L. Chase (on leave), Pearl Z. Janssen, Florence M. King, E. Evelyn Smith, Frances O. Van Duyne.

*Assistant Professors:* Lulu S. Black, Margueritte Briggs, Ruth C. Freeman, Margaret R. Goodyear, Edna R. Gray, Katharine J. Hivon, Dorothy J. Iwig, Gertrude E. Kaiser, Florence A. Kimmelshue, Mary S. Ligon, Mary A. McKee, Beula V. McKey, Anna W. Searl, Marian E. Tolbert, Clareta Walker, Gladys J. Ward, Virginia H. Weaver (on leave), Ritta Whitesel, Helen K. Zwolanek.

*Associates:* Fern Carl, Margaret Corbin, Erma Cottingham, Glenna H. Lamkin, Helen E. McCullough.

*Instructors:* Geraldine E. Acker, Susanna B. Colton, Frances E. Cook, Dorothy F. Durrell, Lucile Hieser, Ruth A. Hodgson, Elizabeth V. Johnson, Ida Johnson, Thelma F. Long, Joda L. McGaughey, Millicent Martin, Royene F. Owen, Bettye J. Phillips, Virginia Seidel, Catherine M. Sullivan, Marion Sympson, Helen D. Turner, Florence Van Norden, Mary E. Vick, Kathryn M. Weesner.

*Assistants:* Lucile F. Adamson, Olive M. Batcher, Winifred B. Cagle, Virginia R. Charles, Roy A. Ginstrom, Carolyn W. Green, Virginia Guthrie, Jessie K. McLuckie, Winifred C. Newton, Carol N. Rasmussen, Barbrea A. Rogers, Rachel J. Rutherford, Jean M. Shively, Helen W. Tolliver, Dorothy O. Twardock, Theresa Walkowiak, Elwanda D. White.

## Requirements for Agriculture Students

See Curriculum in Home Economics (page 63) and in Home Economics Education (page 66)

## Requirements for Education Students

See Curriculum in Home Economics Education (page 66)

## Requirements for L.A.S. Students

**Major in Home Economics:** Twenty hours as specified in Groups II and III, on page 64. (The courses specified in Group I are required, although they are not counted toward the major. The following courses are also required: Art 185; Chemistry 101 or 102, and 132 or 133; Economics 108; Psychology 100 or 103; Sociology 100; at least six hours in English literature; and at least eight hours in bacteriology and physiology. Some of these required courses may be counted in Minor A or Minor B as shown below.)

**Minor A:** Twenty hours chosen from one or two of the following subjects: chemistry, bacteriology. At least eight hours must be taken in each subject if two are chosen.

**Minor B:** Twenty hours chosen from one or two of the following subjects: economics, psychology, sociology. At least eight hours must be taken in each subject if two are chosen.

## Courses for Undergraduates Whose Major Is Not Home Economics

Note: The following non-major courses do not fulfill the requirements for a major in home economics.

**120. Elementary Nutrition.** Fundamental laws of human nutrition; application to the selection of an adequate diet. I, II; 2. Prerequisite: Sophomore standing. Barto.

**125. Introduction to Foods.** Preparation and service of foods; market selection and costs; food values; consumer problems. I, II; 3. Prerequisite: Sophomore standing. Lamkin.

**190. Clothing Selection.** Economic, artistic, psychologic, and hygienic problems in the selection of clothing. Includes no garment construction. I, II; 3. Prerequisite: Sophomore standing. WHITESEL.

**193. Decorative Processes.** Designing and construction of articles requiring knitting, crocheting, braiding, tatting, decorative stitches, appliqué, or other decorative processes. For students in the occupational therapy curriculum only. I, II; 3. Prerequisite: Home Economics 182. DURRELL.

**196. Weaving.** Principles of hand weaving; origins, development, and appreciation of the art of weaving. For students in the occupational therapy and elementary education curricula. I, II; 3. GINSTROM.

**271. Home Management.** Methods for determining the use of time, energy, money, and materials in the home. Relationship between various aspects of homemaking. Emphasis on plans for use of time and money; buying problems. I; 2. GOODYEAR.

## Courses for Undergraduates Whose Major Is Home Economics

NOTE: Courses for undergraduates whose major is home economics are also open to undergraduates whose major is not home economics if these students have the prerequisites listed for the course and/or obtain the consent of the instructor. Students are referred particularly to Home Economics 161, 162, 180, 182, 185, 186, 201, 202, 285, 286, 395.

Home Economics 101, 102, 103, and 104 constitute a general integrated core in home economics designed as an experimental unit to give students fundamental learning experiences needed for successful homemaking and to provide the basis for specialization in the professional curricula in home economics. It is contemplated, eventually, to open these courses to qualified non-home economics students.

Students selected on the basis of pre-testing will be exempt from comparable subject matter in the existing programs in home economics.

**101. Personal Development.** A general home economics course designed to contribute to the development of the student through a better understanding of the essentials of human relationships; techniques of management of time, energy, money, and materials; and principles of nutrition and food preparation. I, II; 5. (Experimental program. Students will be selected on basis of pretesting.) DURRELL, GOODYEAR, HODGSON.

**102. Personal Development.** A general home economics course designed to contribute to the development of the student through a better understanding of the esthetic, psychological, and managerial aspects of clothing selection and construction. I, II; 5. Prerequisite: For home economics majors, Home Economics 101; for non-home economics students, none. COLTON, DURRELL, GOODYEAR, ZWOLANEK.

**103. Family Living.** A course designed to contribute to an understanding of the family, emphasizing child development, design, and management of the home and its furnishings. I, II; 5. Prerequisite: For home economics majors, Home Economics 102.

**104. Family Living.** A course designed to contribute to an understanding of the family, emphasizing family relationships, meals, and home management. I, II; 5. Prerequisite: For home economics majors, Home Economics 103.

**130. Introduction to Foods and Nutrition.** Introductory food preparation and consideration of the nutritional needs of college students. I, II; 2. Prerequisite: High school chemistry or Chemistry 101 or 102, or registration in Chemistry 101. BARTO, HODGSON.

**131. Foods.** Composition and behavior of foods; principles of food preparation. I, II; 3. Prerequisite: Chemistry 132, 133, or 234; Home Economics 130. HODGSON, JANSSEN.

**161. Family Housing.** Relation of housing to family living; basis for choosing house plans, methods of providing housing financial and social aspects. I, II; 3. Prerequisite: Sophomore standing. VAN NORDEN.

**162. The Home and Its Furnishings.** Application of principles of art to the design of the home and its furnishings. Consideration of quality and cost of home furnishings. Survey of historic styles of domestic architecture and furnishings. I, II; 3. Prerequisite: Art 185 and 186. WEESNER.

**170. Introduction to Home Economics.** To give freshmen whose major is home economics a point of view regarding the importance of homemaking and to develop an understanding of the underlying educational philosophy of home economics. I; 1. DURRELL.

180. **Selection and Care of Textiles.** Testing and identification of cloth, including fiber content, design, construction, and finish with emphasis upon quality and suitability for use. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. KING.

182. **Clothing Laboratory.** Fundamentals of clothing construction; fitting problems in the selection of ready-to-wear. I, II; 2. Prerequisite: Home Economics 180, or consent of instructor. LONG, ZWOLANEK.

185. **Clothing.** Psychological, artistic, hygienic, economic, and sociological problems in planning and selecting the wardrobe. I, II; 2. Prerequisite: Credit or registration in Home Economics 180, or consent of instructor. ZWOLANEK.

186. **Costume Design.** Fundamental principles of apparel designs. Study of the variations in actual and fashion figure proportions and its application to dress design. Opportunity to develop originality in design through the medium of fashion sketching. I, II; 2. Prerequisite: Home Economics 180, Art 185 and 186, or consent of instructor. COLTON.

## Courses for Advanced Undergraduates

201. **The Child and His Development.** Interrelationships in the home and in the community. Readings, discussions, and laboratory. I, II; 3. Prerequisite: Psychology 100, or 103, or consent of instructor. JOHNSON.

202. **Laboratory in Child Development.** Observation of young children in an environment to promote learning. Limited to home economics majors. I, II; 2. Prerequisite: Home Economics 201. MARTIN, PERKINS.

210. **Family Relationships.** Problems in family living; emphasis on the mental hygiene approach to growth through experiences in family living and to the woman's responsibility for wholesome family relationships. I, II; 3. PERKINS.

220. **Dietetics.** Food requirements of normal adults and children; nutritive values of foods; application to selection of adequate diets at different cost levels. I, II; 3. Prerequisite: Physiology 103; credit or registration in Home Economics 232. BARTO.

228. **Hygiene and Home Care of Sick.** II; 1. Prerequisite: Junior standing in home economics.

232. **Food Economics and Meal Management.** Distribution and marketing of the food supply; food costs; retail selection of food commodities; meal management. I, II; 3. Prerequisite: Home Economics 131; Economics 108. LAMKIN.

240. **Quantity Cookery.** Handling food materials in large quantities. Time and cost studies. The department cafeteria and cooperating institutions are used for laboratory work. For students who plan to be dietetians in hospitals or other institutions, or who plan to manage lunch rooms for schools. I, II; 3 or 5. Prerequisite: Home Economics 232; consent of instructor. A food handler's certificate is required. E. JOHNSON, E. E. SMITH.

253. **Restaurant Interiors.** Functional planning and decoration. Study of form, color, and textures appropriately combined in fabrics, furniture, and background areas. Suitable fabric structures and finishes. Designed to give the student information and vocabulary necessary to work intelligently with professional decorators. II; 3. WEESNER.

262. **The Home and Its Furnishings.** Creative experience in the use of color and texture, and the arrangement and design of furniture in the home. Interiors of homes are designed, elevation drawings are rendered in color; survey of contemporary designers and modern trends and new products. Field trips to shops and homes. I, II; 3. Prerequisite: Home Economics 162. WEESNER.

272. **Organization and Management of the Home.** Techniques of management of time, energy, money, and materials. Consideration of application of subject matter in various fields of home economics to the home. Emphasis on financial management and consumer problems. I, II; 3. Prerequisite: Home Economics 130; Economics 102 and 103, or 108. GOODYEAR.

273. **Home Management.** Application of management principles and methods to specific situations while in residence in the home management house four weeks during the semester. Emphasis on food management, use of equipment, and evaluation of some homemaking practices. I, II; 3. Prerequisite: Home Economics 220, 232, 272, and/or consent of instructor. GOODYEAR.

277. **Teaching of Home Economics.** Problems dealing with the teaching of home economics in the high school. Required of all who wish to be recommended to teach home economics. I, II; 3. Prerequisite: Home Economics 182, 185, and 232; senior standing. SYMPSON.

285. **History of Costume.** Costumes and their settings from the early Egyptian period through the nineteenth century. I; 2. COLTON.

286. **Clothing.** Design and construction of clothing; pattern making; fitting problems; custom made finishes. I, II; 3. Prerequisite: Home Economics 182, 185, and 186. WHITESEL.

291. **Thesis.** Intended primarily for candidates for honors but open to other seniors. I; 3 to 5. Prerequisite: Senior standing; approval of head of department. GOODYEAR, JANSSEN, KING, PERKINS, E. E. SMITH, J. M. SMITH, VAN DUYNE.

292. **Thesis.** Intended primarily for candidates for honors but open to other seniors. II; 3 to 5. Prerequisite: Senior standing; approval of head of department. GOODYEAR, JANSSEN, KING, PERKINS, E. E. SMITH, J. M. SMITH, VAN DUYNE.

## Courses for Advanced Undergraduates and Graduates

301. **Advanced Problems in Home Guidance of Children.** Emphasis is placed upon the functions and relations of routine and creative activities and the interplay of personalities in the total behavior patterns with a view to helping students understand the less obvious and more subtle aspects of child development, to differentiate between desirable and undesirable guidance procedures practiced by adult members of the family. Limited to home economics majors. II; 3 hours, or ½ to 1 unit. Prerequisite: Home Economics 201 and 202; consent of instructor. PERKINS.

305. **Human Heredity.** Heredity in man and its relation to various individual and social problems. Lectures, discussions, and demonstrations. I; 3 hours, or ½ unit. Graduate credit does not count toward a major in genetics. ROBERTS.

320. **Diet in Disease.** I, II; 3 hours, or ½ unit. Prerequisite: Home Economics 220. BARTO.

321. **Foods and Nutrition.** Recent developments in chemistry, digestion, and metabolism of nutrients. S; 3 hours, or ½ unit. Prerequisite: Home Economics 220; senior standing. Offered in 1951-1952 and in alternate years. J. M. SMITH.

322. **Physical Growth and Nutrition.** Lectures, readings, and discussions. I; 2 hours, or ½ unit. Prerequisite: Home Economics 220; senior standing; consent of instructor. J. M. SMITH.

324. **Problems in Nutrition.** Discussions and investigations. I or II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Home Economics 220; Chemistry 350; senior standing. MCKEY, J. M. SMITH.

326. **Demonstration Problems and Techniques.** Consideration of the techniques of demonstrations and problems involved. S; 3 hours, or ½ unit. Prerequisite: one of the following: Home Economics 232, 262, 272, 301, 379, 380, 386, or consent of instructor.

328. **Readings in Food and Nutrition.** Reports, discussions, and review of scientific literature. I; 1 hour, or ¼ unit. Prerequisite: Home Economics 220; senior standing; credit or registration in one of the following: Chemistry 350, Home Economics 320, 322, 324, 330, or 331. BARTO, MCKEY, VAN DUYNE.

329. **Readings in Food and Nutrition.** Reports, discussions, and review of scientific literature. II; 1 hour, or ¼ unit. Prerequisite: Home Economics 220; senior standing; credit or registration in one of the following: Chemistry 350; Home Economics 320, 322, 324, 330, or 331. BARTO, MCKEY, VAN DUYNE.

**330. Experimental Foods.** A consideration of the manner in which such variables as ingredients, proportions, and techniques in food preparation affect the quality of the product. I, II; 3 hours, or ½ unit. Prerequisite: Home Economics 232; Bacteriology 104. JANSSEN.

**331. Problems in Foods.** Applications of chemical and physical principles to advanced food problems. II; 3 hours, or ½ unit. Prerequisite: Home Economics 330. VAN DUYNE.

**345. Institution Management.** Purchase of food supplies and equipment for institutions; grades of food, judging of quality and cost in relation to season, pure food laws, and government inspection; the storeroom and its management; equipment and furnishing; institution housekeeping, floor plans, and routing; specifications for equipment; inventory of equipment; visits to stores and markets. I, II; 3 hours, or ½ unit. Prerequisite: Credit or registration in Home Economics 240 and Economics 108; consent of instructor. E. E. SMITH.

**350. Institution Dietaries and Administration.** Dietary studies and menu making for various types of institutions, such as dormitories, cafeterias, hospitals, and tearooms; problems of organization, personnel studies, administration of food service, records and cost accountings, professional ethics. Opportunity will be given for observation and practice in various fields. Field trip is required; estimated expense, $40. II; 4 hours, or ½ to 1 unit. Prerequisite: Home Economics 220 and 240; consent of instructor. E. E. SMITH.

**351. Special Problems on Group Feeding with Emphasis on the School Lunch.** Planned for teachers in secondary schools and for home advisers and others interested in community feeding problems. Lectures, discussions, and laboratory practice in quantity food management. Emphasis on the school lunch program as an integral part of the educational system. Special problems in purchasing, floor plans, and equipment will be required of graduate students. No credit for students who have had Home Economics 350 or 355. S; 3 hours, or ½ unit. Prerequisite: Home Economics 220, 232, or equivalent; consent of instructor. Food handlers' certificate required. E. E. SMITH.

**355. Advanced Quantity Cookery and Catering.** Planned for students in the restaurant management curriculum and for other qualified students. Practice in menu making and aspects of management necessary for special catering functions and meal projects. Special lectures and demonstrations emphasizing the artistry of preparation, serving, and merchandising of quality food. Supervised practice in various food service units. Field trips and special assignments. II; 3 hours, or ½ unit. Prerequisite: Home Economics 350; consent of instructor. E. E. SMITH.

**361. Development and Function of Family Housing.** Same as Agricultural Engineering 361. Study of principles and problem solutions in family housing. Basic functions, plan patterns, types, materials, and structure; economic influences, costs, and adaptations; personal and public interests. Lectures, discussions, and problems. II; 3 hours, or ½ unit. Prerequisite: Home Economics 272, or consent of instructor. CARTER.

**375. Home Equipment.** A survey course in which the basic principles related to the selection, use, and care of household equipment are considered. Individual problems will include an evaluation of sources of information on equipment and equipment performance tests. S; 3 hours, or ½ unit. Prerequisite: Home Economics 272; six advanced hours (Group III courses) in home economics; senior standing; consent of instructor.

**377. Home Economics Extension.** History and development; types of county organizations; objectives; extension teaching tools; county program determinations and evaluation. Field trips. II; 3 hours, or ½ unit. Prerequisite: Senior standing in home economics; consent of instructor. BURNS.

**378. Problems in Home Management.** Individual investigation and report of specific problems in the field of home management. I; 3 hours, or ½ unit. Prerequisite: Home Economics 272; consent of instructor. GOODYEAR, PERKINS.

**379. Problems in Home Management.** Individual investigation and report of specific problems in the field of home management. II; 3 hours, or ½ unit. Prerequisite: Home Economics 272; consent of instructor. GOODYEAR, PERKINS.

**380. Textiles.** Textiles from the economic, artistic, physical, and chemical viewpoints. I; 3 hours, or ½ unit. Prerequisite: Home Economics 180; Chemistry 132; Economics 108; senior standing; consent of instructor. KING.

**386. Clothing Design and Construction.** Problems in creating original designs, developing a more thorough understanding of the figure through design adaptation. Emphasis on adaptability to fabric draping or flat pattern construction. Investigation of sources of inspiration and relationship to significant trends in design. II; 4 hours, or 1 unit. Prerequisite: Home Economics 285 and 286; senior standing. KING, WHITESEL.

**388. Problems in Textiles and Clothing.** Investigation and report of specific problems in the field of textiles and clothing. I; 3 hours, or ½ unit. Prerequisite: Home Economics 286 or 380; senior standing; consent of instructor. Each student will undertake an individual problem which in some cases may involve prerequisites in chemistry and physics. KING, WHITESEL.

**389. Problems in Textiles and Clothing.** Investigation and report of specific problems in the field of textiles and clothing. II; 3 hours, or ½ unit. Prerequisite: Home Economics 286 or 380; senior standing; consent of instructor. Each student will undertake an individual problem which in some cases may involve prerequisites in chemistry and physics. KING, WHITESEL.

**395. Fashion Analysis.** Factors affecting design, production, distribution, promotion, and trends in fashion development; forecasting methods of measurement and prediction; price levels—relation to fashion cycle and quality in design and workmanship. II; 3 hours, or ½ unit. Prerequisite: Consent of instructor. KING.

## HORTICULTURE

*Professors:* C. J. BIRKELAND (Head of Department), H. W. ANDERSON, J. C. BLAIR (Emeritus), A. S. COLBY, H. B. DORNER (Emeritus), M. J. DORSEY (Emeritus), W. A. HUELSEN, M. B. LINFORD, J. W. LLOYD (Emeritus).

*Associate Professors:* J. R. KAMP, V. W. KELLEY, M. B. LINN, R. V. LOTT, J. P. MCCOLLUM, D. POWELL, H. H. THORNBERRY, F. F. WEINARD.

*Assistant Professors:* J. R. CULBERT, D. GOTTLIEB, J. C. MCDANIEL, L. A. SOMERS, B. L. WEAVER.

*Associates:* C. Y. ARNOLD, W. N. BROWN.

*Instructors:* G. M. FOSLER, D. D. HICKMAN, H. R. KEMMERER, R. K. SIMONS, J. S. TITUS.

*Assistants:* H. C. BARRETT, K. E. BELL, H. L. BOLL, M. B. DAVIS, D. F. DAYTON, P. R. HEPLER, R. P. KAHN, T. G. KLINE, E. W. MELVIN, VIVIAN M. OSTBOE, R. R. RICE, C. E. TAYLOR, BERNICE L. TORCH.

### Courses for Undergraduates

**100. Introductory Horticulture.** A beginning general course showing how horticulture fits into the general field of agriculture and into the economic and social life of the individual; to acquaint the student with horticulture as a specialty or profession and to correlate fundamental plant processes with horticultural practices. This course will be particularly helpful to students in general and vocational agriculture, agricultural extension, and processing of horticultural crops. I, II; 3 hours. No credit for juniors or seniors.

**110. Plant and Animal Genetics.** Same as Agronomy 110, Animal Science 110, and Dairy Science 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104.

**121. Plant Propagation.** Current practices in growing plants from seeds, cuttings, layers, grafts, and buds. Theoretical consideration of these practices. Lectures, discussion, and laboratory. I; 3. KAMP.

**122. Greenhouse Management.** Principles of greenhouse operation, soils, fertilizers, potting, watering, ventilating. Lectures, reference readings, and greenhouse practice. II; 3. Prerequisite: Botany 100; Horticulture 121. CULBERT.

142. **Introductory Vegetable Crops.** For students not specializing in vegetable crops. Discussions. II; 2. No credit allowed to students with 95 or more credit hours. ARNOLD, BROWN.

161. **Introductory Pomology and Ornamental Gardening.** Adaptation, growing, harvesting, storage, and marketing of fruits; principles and practices of ornamental gardening. I, II; 3. Students with 95 or more credit hours receive only 2 hours credits. Prerequisite: Botany 100. BELL, COLBY, KELLEY.

162. **Small Fruit Culture.** Principles and practices involved in the culture of the grape, raspberry, blackberry, dewberry, currant, gooseberry, blueberry, cranberry, elderberry, juneberry, bush quince, and strawberry. Lectures, assigned readings, and laboratory. II; 3. Prerequisite: Sophomore standing; Horticulture 161. COLBY.

## Courses for Advanced Undergraduates

201. **Special Problems** I. Work may be taken in the following subjects: (a) pomology, (b) vegetable crops, (c) floriculture, (d) fruit breeding, (e) plant pathology. I; 3 to 5. Prerequisite: Twenty hours pertinent to the thesis problem, or approval of head of department. A thesis will be required only if Horticulture 201 and 202 are taken. ANDERSON, BIRKELAND, COLBY, CULBERT, FOSLER, HUELSEN, KAMP, KELLEY, LINN, LOTT, MCCOLLUM, POWELL, THORNBERRY, WEAVER, WEINARD.

202. **Special Problems II.** Work may be taken in the following subjects: (f) pomology, (g) vegetable crops, (h) floriculture, (i) fruit breeding, (j) plant pathology. II; 3 to 5. Prerequisite: Twenty hours pertinent to the thesis problem, or approval of head of department. A thesis will be required only if Horticulture 201 and 202 are taken. ANDERSON, BIRKELAND, COLBY, CULBERT, FOSLER, HUELSEN, KAMP, KELLEY, LINN, LOTT, MCCOLLUM, POWELL, THORNBERRY, WEAVER, WEINARD.

204. **Spraying.** Same as Agricultural Engineering 204. A study of spray materials and equipment used for control of insects and diseases on horticultural crops. II; 3. Prerequisite: Horticulture 142 or 161, Chemistry 101 or 102, Agricultural Engineering 101, or consent of instructor. Offered in alternate years. POWELL.

223. **Commercial Floricultural Crops.** Commercial production of greenhouse cut flowers and pot plants. Lectures, reference readings, and laboratory in the greenhouse. I; 3. Prerequisite: Horticulture 122. CULBERT.

224. **Commercial Floricultural Crops.** Continuation of Horticulture 223. II; 3. Prerequisite: Horticulture 223. CULBERT.

226. **Tender Bedding Plants.** Commercial production and use of tender ornamental plants grown for bedding purposes. II; 3. Prerequisite: Horticulture 122. FOSLER.

230. **Garden Flowers.** Requirements and uses of annuals, bulbs, and herbaceous perennials in the garden. Study of important genera of garden ornamentals. II; 3. Prerequisite: Botany 100. KAMP.

231. **Floral Decorations.** The decorative use of flowers, foliages, and accessories; retail flower store management. Lectures, reference readings, laboratory. For advanced floriculture students only. I; 3. CULBERT.

232. **Floral Decorations.** The decorative use of flowers, foliages, and accessories; retail flower store management. Lectures, reference readings, laboratory. For advanced floriculture students only. II; 3. CULBERT.

242. **Commercial Vegetable Production.** Lectures, discussion, and reference reading. For agricultural education students and others who need information on where and how vegetables are grown for market. II; 3. Prerequisite: Horticulture 142, or junior standing. WEAVER.

263. **Orcharding.** Discussions, lecture, and laboratory relating to production of deciduous tree fruits, with emphasis on the commercial production of apple and peach. I; 5. Prerequisite: Horticulture 161. SIMONS.

267. **Systematic Pomology.** I; 2. Prerequisite: Horticulture 142 and 161. Offered in 1952-1953 and in alternate years. SIMONS.

269. **Raw Materials for Processing.** Same as Food Technology 269. Lectures, reference readings, and laboratory work with fruits and vegetables important to the food processing industry. I; 3. Prerequisite: Botany 100, or equivalent. LOTT, MCCOLLUM.

## Courses for Advanced Undergraduates and Graduates

307. **Fruit Diseases.** Same as Botany 307 and Plant Pathology 307. Symptomatology, control measures. Laboratory and field studies of representative diseases. I; 3 hours, or ½ unit. Prerequisite: Horticulture 317 or Botany 372. Offered in 1951-1952 and in alternate years. ANDERSON.

308. **Vegetable and Canning Crop Diseases.** Same as Botany 308 and Plant Pathology 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Horticulture 317 or Botany 372. Offered in 1952-1953 and in alternate years. LINN.

317. **Plant Pathology.** Same as Agronomy 317, Botany 317, and Plant Pathology 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. LINFORD.

321. **Floricultural Physiology.** Plant hormones; effect of light, temperature, humidity, and gases on growth of ornamental plants; principles of disease and insect control. Lectures, assigned readings, and discussion. I; 3 hours, or ½ unit. Prerequisite: Botany 130. WEINARD.

322. **Plant Nutrition.** Soil conditions in relation to the growth of ornamental plants; soil and plant tissue tests, fertilizers and their use; soil-less culture; water supplies and automatic watering. Lectures, assigned readings, discussions. II; 3 hours, or ½ unit. Prerequisite: Botany 130; Agronomy 201. WEINARD.

333. **Marketing Horticultural Products.** Same as Agricultural Economics 333 and Marketing 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 130, Marketing 101, or twelve hours of horticulture. KELLY.

343. **Structure and Classification of Vegetable Crop Plants.** Principles of classification and structure of vegetable crop plants with special reference to their use and production. I; 3 hours, or ½ unit. Prerequisite: Botany 100. Offered in 1952-1953 and in alternate years.

345. **Growth and Development of Vegetable Crops.** Factors affecting growth, development, and quality of vegetable crops. Discussions. I; 4 hours, or 1 unit. Prerequisite: Botany 130, or consent of instructor; senior standing. Offered in 1951-1952 and in alternate years. MCCOLLUM.

361. **Current Horticultural Literature.** Assigned topics; review of books, technical journals, and other publications. I; 1 hour, or ¼ unit. MCCOLLUM.

362. **Current Horticultural Literature.** Assigned topics; review of books, technical journals, and other publications. II; 1 hour, or ¼ unit. MCCOLLUM.

379. **Research Methods in Plant Pathology.** Same as Agronomy 379, Botany 379, and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism; and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Horticulture 317; senior standing. GERDEMANN, GOTTLIEB, THORNBERRY.

382. **Improvement of Horticultural Crops by Breeding.** Mechanism of hereditary variations and varietal differentiation in horticultural plants as a basis for determining the method of approach to crop improvement problems, with emphasis on asexually propagated crops. II; 3 hours, or ½ unit. Prerequisite: One year of horticulture, or equivalent, exclusive of Horticulture 142 and 161. Offered in 1951-1952 and in alternate years. BIRKELAND.

# HUMANITIES

The Division of the Humanities is composed of the departments of Classics, English, French, German, History, Philosophy, Spanish and Italian, and Speech. It sponsors several courses of interdepartmental interest and purpose, serving the requirements of the College of Liberal Arts and Sciences in general education. Its teaching faculty consists of the full-time faculties of the departments listed, of the rank of instructor and above.

The Division also sponsors the curriculum in medieval civilization described on page 182 and the curriculum in American civilization described on page 180.

## Courses for Advanced Undergraduates

**211. The Growth of American Culture.** The social, intellectual, and spiritual foundations and development of American life and modes of cultural expression. I; 4. Prerequisite: Junior standing. BESTOR, FLANAGAN, WELLER.

**212. The Growth of American Culture.** The social, intellectual, and spiritual foundations and development of American life and modes of cultural expression. II; 4. Prerequisite: Junior standing. BESTOR, FLANAGAN, WELLER.

## Courses for Advanced Undergraduates and Graduates

**301. Introduction to Linguistics.** An introduction to the science of descriptive linguistics. I; 3 hours, or 1 unit. Prerequisite: Fulfillment of the foreign language requirement in Liberal Arts and Sciences, or the equivalent. KAHANE.

**302. Comparative Linguistics.** An introduction to the historical aspects of language. II; 3 hours, or 1 unit. Prerequisite: Fulfillment of the foreign language requirement in Liberal Arts and Sciences, or equivalent.

# HYGIENE

*Associate Professors:* MARJORIE M. SMARZO, L. MIHELICH.

*Assistant Professors:* H. L. LAWDER (Acting Head of Department of Health Service), G. H. AGATE, T. F. CROWLEY, MARIE A. HINRICHS, G. F. KOLAR, L. D. LEWIS, MAY I. MILLBROOK, R. B. MONTGOMERY, DOROTHY E. SHELLEY, H. I. TEIGLER.

*Associate:* G. R. BLACKSTONE (Emeritus).

*Instructors:* DOROTHY F. DUNN, J. OTIS.

## Courses for Undergraduates

**101. Health Lectures.** This course or Hygiene 104 is required of all undergraduate men and women during their first year of residence. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Students who expect to take Hygiene 110 and 216 should fulfill the undergraduate hygiene requirement by taking Hygiene 104 instead of Hygiene 101. AGATE, CROWLEY, DUNN, HINRICHS, KOLAR, LAWDER, LEWIS, MIHELICH, MILLBROOK, MONTGOMERY, OTIS, SHELLEY, TEIGLER.

**104. Personal and Community Hygiene.** This course or Hygiene 101 is required of all undergraduate men and women during their first year of residence. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Those students who expect to take Hygiene 110 or 216 should take Hygiene 104 (the prerequisite). Hygiene 104 is a more comprehensive course than Hygiene 101 for those interested in a more intensive study of personal and community hygiene. It is especially designed for teachers, coaches, and others who feel they will need this course in their future professional work. AGATE, CROWLEY, DUNN, HINRICHS, KOLAR, LAWDER, LEWIS, MIHELICH, MILLBROOK, MONTGOMERY, OTIS, SHELLEY, TEIGLER.

**106. Sex Education and Family Life.** This course is offered to people who are interested in understanding the problems of sex education and realizing the fullest implications

of married life relationships, and especially to students planning to teach sex education and hygiene or do counseling work. Besides class lectures, there are discussions in mixed and divided groups, films, guest lecturers, and use of latest teaching materials in this field. I, II; 2. Prerequisite: Hygiene 101 or 104; consent of instructor.

110. **Public Health.** Especially suited to the needs of teachers, coaches, and social workers. I, II; 2. Prerequisite: Hygiene 104. AGATE, DUNN.

### Courses for Advanced Undergraduates

216. **Medical Terminology Correlated with Community Health Problems.** I; 2. Prerequisite: Hygiene 104; registration in occupational therapy curriculum; junior standing or consent of adviser. MILLBROOK.

## INDUSTRIAL EDUCATION

(See Education)

## ITALIAN

(See Spanish and Italian)

## JOURNALISM

### (Including Journalism, Radio, and Advertising)

*Professors:* F. S. SIEBERT (Director of School of Journalism and Communications), R. R. BARLOW, O. C. LEITER (Emeritus), L. W. MURPHY, A. RAE, C. H. SANDAGE, W. SCHRAMM.

*Associate Professors:* Q. HOWE, R. B. HUDSON, L. W. MCCLURE, M. D. SEIL, J. F. WRIGHT.

*Assistant Professors:* D. E. BROWN, V. R. FRYBURGER, D. D. JACKSON, R. D. MILLICAN, F. E. SCHOOLEY, J. T. TREBILCOCK.

*Instructors:* H. V. CORDIER, D. G. HILEMAN, H. E. HILL, J. W. JENSEN, T. B. PETERSON, R. L. RIDER, F. B. SENGER, P. A. SPRADLING, A. E. STRANG, J. C. SUTTON, J. B. WOODSON.

### Courses for Advanced Undergraduates

204. **Typography.** Study of type faces, families, and sizes; mechanical equipment; graphic art processes, engraving process, offset, gravure, stereotyping; composing room organization; proofreading; copy fitting; paper. I, II; 2. SEIL and others.

211. **Reporting.** News values and story form; gathering and writing news. I, II; 3. TREBILCOCK and others.

212. **Reporting Practice.** News of public affairs. I, II; 3. Prerequisite: Journalism 211. SUTTON.

215. **Contemporary Affairs.** Major news developments and their background; current political, economic, social, and scientific developments. I; 2. HOWE.

216. **Contemporary Affairs.** Major news developments and their background; current political, economic, social, and scientific developments. II; 2. HOWE.

217. **History of Journalism (United States).** Forerunners of the press; beginnings of journalism in America; colonial press; journalism of the Revolution; the party press; popular journalism in the United States; great editorial leaders of the period of personal journalism; recent leaders and tendencies. I, II; 3. MURPHY.

218. **The Press and Public Opinion.** Critical analysis of the role of the press in a democracy; effects of newspaper practices on public opinion; the role of propaganda; international journalism and public opinion; problems of reporting public affairs. I, II; 3. BARLOW.

223. **Press Photography.** A thorough basic course with emphasis on press-type photography. Students learn to use the Speed Graphic camera, process film, and finish prints. Assignments include news, picture-series, and salon work. I, II; 3. Prerequisite: Journalism 211. WOODSON.

227. **Magazine Article Writing.** Preparation of feature stories and articles; techniques of marketing, marketing analysis, and selling of articles written in the course. I, II; 3. PETERSON.

229. **Critical Writing and Reviewing.** News and comment of the stage, books, movies, and fine arts. II; 2. Prerequisite: Journalism 212, or consent of instructor. MURPHY.

231. **Journalism in a Democratic Society.** Study of the philosophical bases of the functions and the responsibilities of mass communications. I, II; 3. JENSEN, PETERSON.

241. **Newspaper Management.** Principles and methods in the operation of daily and weekly newspapers. Managerial problems of the editorial, advertising, circulation, and commercial printing departments; plant operation. I; 3. Prerequisite: Credit or registration in Journalism 204. MCCLURE.

244. **Community Newspaper Publication.** Study of weekly newspapers in handling news, editorials, features, pictures, and correspondence, and in meeting business, circulation, and advertising problems. It includes one or more field trips for each student, with actual work on a small newspaper; approximate cost to student, $5. II; 3. Prerequisite: Senior standing in the School of Journalism and Communications. STRANG.

261. **Principles of Broadcasting.** An Introductory course in the history of American broadcasting, comparative broadcasting systems, organization and operation of stations and networks, social and legal responsibilities of radio, codes and practices of broadcasting, and an introduction to radio audience measurement and survey methods. I, II; 2. HILL, HUDSON, SCHOOLEY.

263. **Radio Announcing.** Intensive training in studio procedures and interpretation of radio copy, including news, feature scripts, continuity, and commercials. I, II; 2. Prerequisite: Speech 141, or equivalent; consent of instructor. SPRADLING.

264. **Radio Acting.** The techniques and special problems of acting in radio. Lectures, demonstrations, and practical microphone experience, with the emphasis throughout on individual development in interpretation and characterization. I, II; 2. Prerequisite: Consent of instructor. RIDER.

265. **Radio Continuity Writing.** A course in the principles of all forms of nondramatic radio writing, including music program continuity, talks programs, audience participation programs, feature programs, and commercial continuity, with some study of television scripts and commercials. I; 2. Prerequisite: Journalism 261. CORDIER.

266. **Radio Dramatic Writing.** A study of the fundamentals of dramatic script writing, including plotting, characterization, pacing, mood, and the handling of dialogue, transitions, and sound patterns, with some attention given to television drama. II; 3. Prerequisite: Consent of instructor. CORDIER.

267. **Radio Production and Direction.** Study of the basic principles of planning, casting, rehearsing, and airing varied program types, with emphasis on advanced techniques of dramatic production. I, II; 3. Prerequisite: Senior standing in radio curriculum. CORDIER.

281. **Introduction to Advertising.** A survey of the economics, psychology, and philosophy of advertising; preparation of advertisements; selection of media; and organizational structure. I, II; 3. SANDAGE and others.

282. **Advertising Procedures.** Same as Marketing 282. This course is designed to give students who do not wish to major in advertising an opportunity to become familiar with the basic elements of typography, copy, and layout. I, II; 3. Students will not

be given credit toward graduation for both Journalism 282 and 382. Prerequisite: Journalism 281, or Marketing 281. WALES.

283. **Current Advertising Developments.** Same as Marketing 283. An analysis of problems, practices, and prospects in the field of advertising as viewed by current practitioners and writers. II; 1. Prerequisite: Senior standing and major in advertising, or consent of instructor. SANDAGE.

288. **Sales Writing.** Same as Marketing 288 and Rhetoric 271. Direct mail campaigns and company magazine copy. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151, or consent of instructor. SARGENT.

291. **Special Problems.** Selected problems in the field of journalism including projects in advertising, agricultural and home economics journalism, editorial work, photography, high school journalism, publicity, and radio. I; 2 to 3. Prerequisite: Senior standing in the School of Journalism and Communications; consent of instructor. STAFF.

292. **Special Problems.** Continuation of Journalism 291. II; 2 to 3. Prerequisite: Senior standing in the School of Journalism and Communications; consent of instructor. STAFF.

## Courses for Advanced Undergraduates and Graduates

308. **High School Journalism.** Journalistic writing in the high school; newspaper study and training of newspaper readers; supervision of school publications and publicity; junior college courses in journalism. I, II; 3 hours, or ½ unit. Prerequisite: Education 109, or consent of instructor. BROWN.

309. **Public Relations.** Publicity methods and public relations; representation of business and other sponsors to the public and representation of the public to employers. Preparation of public relations units for the press and other media. I; 2 hours, or ½ unit. Prerequisite: Senior standing in the School of Journalism and Communications, or consent of instructor. MURPHY.

310. **Press Systems of the World.** Press of England, France, Germany, Italy, Russia, Latin America, China, and Japan; international organization of the press. II; 2 hours, or ½ unit. BARLOW.

311. **Newspaper Law.** Freedom of the press; the right to gather, publish, and comment on the news. I; 3 hours, or ½ unit. TREBILCOCK.

320. **Editorial Studies and Writing.** Writing of editorials and preparation of editorial judgments. Policies for editorials and for the editorial page. I; 3 hours, or ½ unit. Prerequisite: Journalism 212; senior standing in the School of Journalism and Communications. BARLOW.

321. **Copyreading.** Newspaper desk work; editing the news; correction of faulty news stories; handling wire copy. Attention to head-writing, news pictures, makeup and design of newspaper pages. I, II; 4 hours, or 1 unit. Prerequisite: Credit or registration in Journalism 204; Journalism 212. RAE.

323. **Advanced Reporting.** Advanced types of news investigation and treatment. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 212, or equivalent. TREBILCOCK.

328. **Industrial Publications.** Problems and techniques of editing house organs. II; 2 hours, or ½ unit. Prerequisite: Journalism 211 or 227. PETERSON.

343. **Newspaper Circulation Problems.** Study of the promotion, sales, distribution, and administration problems of the circulation departments of weekly and daily newspapers. I; 3 hours, or ½ unit. Prerequisite: Journalism 241. RAE.

351. **Graphic Production Processes.** Detailed study of the preparation of copy and illustrative material for the mass production of news, features, and advertising; comparison of quality and costs of production processes; consideration of personnel, equipment, and raw materials entering into graphic production. Field trips to Danville and Chicago; estimated expense, $15. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 204. SEIL.

**362. Radio Station Management.** A study of the organization and administration of the radio staff and station; public relations, personnel management, and station operations; analysis of station and agency relationships and radio sales procedure; methods and media for program and station promotion; law and regulations affecting management, financing, and labor relationships. II; 2 hours, or ½ unit. Prerequisite: Journalism 261; senior standing. SCHOOLEY.

**365. Radio News.** News writing and editing for broadcasting; radio news style; preparation and practice for special event reporting; commentaries and interpretations; radio news services, and processing radio news service copy. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 212. BROWN.

**366. Advanced Radio Practices I.** Project work for advanced students in selected areas of radio, including radio news, radio advertising, radio announcing, radio production and direction, radio writing. I; 2 hours, or ½ unit. Prerequisite: Consent of instructor. STAFF.

**367. Advanced Radio Practices II.** Project work for advanced students in selected areas of radio, including radio news, radio advertising, radio announcing, radio production and direction, radio writing. II; 2 hours, or ½ unit. Prerequisite: Consent of instructor. STAFF.

**368. Radio Regulations.** Federal legislation, with emphasis on the Communications Act of 1934 and the regulations of the Federal Communications Commission, legal problems in program operations, censorship and editorial selections, copyright, and author-producer relations. II; 2 hours, or ½ unit. SIEBERT.

**382. Advertising Copy and Layout.** Same as Marketing 382. Theory and practice of advertising copy writing and layout for newspaper, magazine, and direct mail. Advertising planning for the local advertiser. Use of consumer and market surveys, copy-testing methods, and advertising readership studies. I, II; 4 hours, or 1 unit. Students will not be given credit toward graduation for both Journalism 382 and 282. Prerequisite: Journalism 281, or Marketing 281; Journalism 204. MILLICAN and others.

**383. Advertising Media.** Same as Marketing 383. Analysis of the various advertising media in terms of markets served and factors to consider in the selection of media. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281, or Marketing 281. FRYBURGER.

**384. Advertising Campaigns.** Same as Marketing 384. Planning and execution of an advertising campaign; market and consumer research; development and allocation of advertising budget; organization and functions of advertising agency; choice of advertising appeals; selection of media; preparation of advertisements—copy and layout. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 382 and 383. Graduate students may not receive credit for both Journalism 384 and 387. WEDDING.

**385. Advertising Promotion and Sales.** Same as Marketing 385. Sales problems, advertising promotion, advertising research, market research. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 382. MCCLURE.

**386. Radio Advertising.** Same as Marketing 386. Economics, standards, and ethics as applied to radio commercials; sponsorship, rates, and advertising techniques, including merchandising, marketing, servicing, and sales; preparation and presentation of radio advertising copy, measurements, and listener surveys. I, II, 2 hours, or ½ unit. Prerequisite: Journalism 281, or Marketing 281. FRYBURGER.

**387. Advertising Policies and Problems.** Same as Marketing 387. Analysis of actual advertising situations and study of how such situations were or might have been met. Consideration given to management and technical problems at both the national and retail levels. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Journalism 281, or Marketing 281. Graduate students may not receive credit for both Journalism 384 and 387. WEDDING.

**390. Economics of Communications I.** Same as Economics 390. Economic problems associated with the various forms of radio broadcasting including FM, television, and facsimile, and the use of radio for the safety and efficiency of transportation, protective services, etc. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

391. **Economics of Communications II.** Same as Economics 391. Economic problems associated with the following means of communication: motion pictures, newspapers, magazines, and books. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

## LABOR AND INDUSTRIAL RELATIONS

*Professors:* W. E. CHALMERS (Director of Institute of Labor and Industrial Relations, on leave), M. DERBER, P. L. GARMAN, R. D. LOKEN, E. B. MCNATT, W. H. MCPHERSON, L. L. MCQUITTY, J. B. PARRISH, R. STAGNER, R. N. SULLIVAN.

*Associate Professors:* R. DUBIN, C. B. HAGAN, L. C. PIGAGE, E. C. WOLFE.

*Assistant Professors:* J. M. BRUMM, MARGARET K. CHANDLER, M. EDELMAN, O. H. ERICKSON, H. L. GAMMILL, J. F. HUMES, S. B. LEVINE, R. E. MCCOY, R. WILCOCK, D. WRAY.

*Research Associates:* THELMA B. FOX, RUTH A. HUDSON.

*Instructor:* W. POLNER.

### Courses for Advanced Undergraduates and Graduates

312. **Problems of Administration and Organization.** Same as Management 312. Problems of the individual and groups brought about by modern industrial organizations and techniques. Motivations for work and cooperation between executives and different economic and social groups. I, II; 3 hours, or ½ unit. Prerequisite: Management 101, or equivalent. DUBIN.

318. **Human Relations in Industry.** Same as Sociology 318. Sociology of industry and problems of personal adjustment. The emergence of modern industrial and labor organizations and their impact upon community life. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Psychology 100; Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, or consent of instructor. CHANDLER, DUBIN, WRAY.

342. **Economics of Social Security.** Same as Economics 342. A critical analysis of the economic issues and problems involved in our legislative efforts to reduce the economic risks of unemployment, old age dependency, and industrial injury. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. MCNATT.

343. **The Labor Market.** Same as Economics 343. Economic analysis of the labor market, its structure, characteristics, and operations in contrast with other markets; factors making for equilibrium and disequilibrium; migration; occupational and industrial mobility; labor market research including techniques and materials. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108; Economics 240. PARRISH.

344. **The Law and Labor.** Same as Economics 344. An economic analysis of the problems and issues arising out of the legislative and judicial efforts to define the rights, duties, and responsibilities of labor organizations and management in the field of industrial relations. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; Economics 240. MCNATT.

346. **Foreign Labor Movements.** Same as Economics 346. Analysis of the history, organization, economic policies, political programs, and domestic, international, and contemporary influence of the labor movements of Great Britain, Sweden, Germany, France, Latin America, and Russia. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 240.

357. **Psychology of Industrial Conflict.** Same as Psychology 357. An analysis, in terms of the behavior of individuals, of the causes and possible solutions of industrial conflict. Motives, emotions, attitudes, and ways of perceiving situations are considered in relation to the actions of industrial executives, factory workers, and union leaders. Results of factory observation, public opinion polls, laboratory experimentation, and psychoanalysis are integrated to provide a systematic interpretation of the problem, and to evaluate proposed actions toward a solution. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100, or equivalent; Psychology 145, or Economics 240, or Sociology 318. STAGNER.

**365. Theory and Administration of Federal Labor Law.** Same as Political Science 365. Critical analysis of the relationship between group pressures on government and public policy affecting labor; role of administration in formation of policy; problems and experience of federal agencies operating in the labor field. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. EDELMAN.

**376. Statistics of Labor.** Same as Economics 376. A study of the methods and problems involved in the derivation of "labor statistics" from both the theoretical and practical points of view. The statistical aspects of the measurement, analysis, and interpretation of data on wages, employment, labor force, and productivity are stressed. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 170, or equivalent.

**380. Labor Law.** Same as Law 380. The law of industrial relations with special emphasis on recent cases and legislation; collective bargaining and labor contracts; wages and hours legislation; unemployment compensation. I or II; 3 hours, or 1 unit. SULLIVAN.

## LANDSCAPE ARCHITECTURE

*Professors:* O. G. SCHAFFER (Head of Department), H. BARTHOLOMEW, K. B. LOHMANN, D. H. MORGAN, FLORENCE B. ROBINSON, S. H. WHITE.

*Assistant Professors:* J. A. EDSALL, V. A. HYDE, I. L. PETERSON.

*Instructor:* W. KEITH.

### Courses for Undergraduates

**111. History of Landscape Architecture.** Lectures, reference readings, library sketches, and reports. Required of freshmen in the professional course; open to other students with consent of instructor. I; 3. PETERSON.

**132. Elements of Landscape Architecture.** Delineation of landscape forms, drafting, lettering, wash rendering, color and color harmony, elementary composition. II; 3. Students with 95 or more credit hours receive only 2 hours credit. WHITE.

**133. Elementary Landscape Design.** Principles of landscape composition, elements of the natural landscape, types of drafting. Lectures, reference readings, plan work, and field trips. I; 3. Prerequisite: Landscape Architecture 131 and 132. KEITH.

**134. Elementary Landscape Design.** Principles of landscape composition, elements of the natural landscape, types of drafting. Lectures, reference readings, plan work, and field trips. II; 3. Prerequisite: Landscape Architecture 131 and 132. KEITH.

**164. Appreciation of Landscape Architecture.** An introduction to the relationship of landscape practice to present-day life and living. For non-professional students only. II; 3. Prerequisite: Sophomore standing. PETERSON.

**174. Regional Planning.** Interrelationships and planned arrangements of regions and groups of regions; metropolitan, county, state, and national planning. II; 3. Prerequisite: Sophomore standing. LOHMANN and others.

### Courses for Advanced Undergraduates

**213. Development and Theory of Contemporary Landscape Architecture.** Influences which affected landscape design from the nineteenth century to the present and analysis of contemporary theories of landscape design. I; 3. Prerequisite: Junior standing in landscape architecture or consent of instructor. WHITE.

**235. Intermediate Landscape Design.** Gardens, estates, playgrounds, and small parks. Lectures, readings, written reports, sketching and plan work, field trips. I; 4. Prerequisite: Landscape Architecture 133 and 134. KEITH.

**236. Intermediate Landscape Design.** Gardens, estates, playgrounds, and small parks. Lectures, readings, written reports, sketching and plan work, field trips. II; 4. Prerequisite: Landscape Architecture 235. KEITH.

**237. Advanced Landscape Design.** Public and semi-public properties; schools, rural parks, golf courses, and cemeteries. I; 5. Prerequisite: Landscape Architecture 236. WHITE.

**238. Advanced Landscape Design.** Public and semi-public properties; schools, rural parks, golf courses, and cemeteries. II; 5. Prerequisite: Landscape Architecture 237. WHITE.

**243. Landscape Construction.** Beginning course. Elements of grading, profiles and cross sections, water distribution, specifications, working drawings and reports. I; 3. Prerequisite: Civil Engineering 117 and 118. SCHAFFER.

**244. Landscape Construction.** Beginning course. Elements of grading, profiles and cross sections, water distribution, specifications, working drawings and reports. II; 3. Prerequisite: Civil Engineering 117 and 118. KEITH, SCHAFFER.

**246. Office Practice.** Professional ethics and methods of practice. Professional charges. Landscape contracts and specifications. II; 2. Prerequisite: Landscape Architecture 237. SCHAFFER.

**248. Advanced Landscape Construction.** Advanced problems relating to landscape construction: grading, drainage, road building, walks, retaining walls, foot bridges, culverts, cost estimates. The course is concerned with general layouts rather than with structural design. II; 3. Prerequisite: Landscape Architecture 243 and 244. SCHAFFER.

**251. Trees and Shrubs.** Identification and landscape characteristics of trees, shrubs, evergreens, and vines. Open only to landscape architecture and floriculture students. I; 3. Prerequisite: Botany 100. ROBINSON.

**252. Trees and Shrubs.** Identification and landscape characteristics of trees, shrubs, evergreens, and vines. Open only to landscape architecture and floriculture students. II; 3. Prerequisite: Botany 100. ROBINSON.

**253. Planting Design.** Color charts, fundamentals of planting composition. Plans, sketches, and models. I; 4. Prerequisite: Landscape Architecture 236, 251, and 252. ROBINSON.

**254. Planting Design.** Color charts, fundamentals of planting composition. Plans, sketches, and models. II; 4. Prerequisite: Landscape Architecture 253. ROBINSON.

**255. Care of Plant Materials.** Elements of planting practices, pruning, soil preparation, insect pests, tree surgery. I; 2. Prerequisite: Landscape Architecture 236 and 252. SCHAFFER.

**271. Planning of Towns and Cities.** The background facts of community development; physical problems and possibilities for improved community layout; the city plan and its elements. Open to students in other departments. Inspection trip required of all landscape students but optional for others. I; 2. LOHMANN, BARTHOLOMEW.

**272. Planning of Towns and Cities.** Continuation of Landscape Architecture 271. II; 2. Prerequisite: Landscape Architecture 271. LOHMANN, BARTHOLOMEW.

## LAW

*Professors:* A. J. HARNO (Dean of College of Law), W. E. BRITTON, K. S. CARLSTON, E. W. CLEARY, G. W. GOBLE, F. GREEN (Emeritus), H. W. HOLT, R. F. LESEMANN, O. L. MCCASKILL (Emeritus), M. I. SCHNEBLY, R. N. SULLIVAN, W. L. SUMMERS, G. B. WEISIGER.

*Associate Professors:* R. G. COHN, A. F. CONARD, J. G. THOMAS.

*Assistant Professors:* C. H. BOWMAN, J. E. CRIBBET, R. J. FALETTI, J. N. YOUNG.

*Participating from Other Departments:* R. I. DICKEY, E. L. ERICKSON, F. B. FREIDEL, C. M. KNEIER.

### Nonprofessional Course

**201. Fundamentals of Accounting.** Same as Accountancy 201. A survey course in the principles of accounting. Required of students in the four-year curriculum in law. I, II; 3. DICKEY and others.

## Professional Courses

**301. Contracts A.** Offer and acceptance, consideration, seals, Statute of Frauds. I, II; 3. FALETTI, GOBLE.

**302. Contracts B.** Third party beneficiaries, assignment, conditions, impossibility, anticipatory repudiation, and discharge; contract and quasi-contract distinguished, and measure of damages for each. I or II; 3. Prerequisite: Law 301. GOBLE.

**303. Torts A.** Trespass, conversion, negligence. I, II; 3. WEISIGER.

**304. Torts B.** Defamation, disparagement of property, fraud, absolute liability, and torts requiring intentional invasions of various interests. I or II; 3. Prerequisite: Law 303. WEISIGER.

**305. Judicial Remedies.** Common-law forms of action, extraordinary legal remedies, equitable remedies, abolition of the forms of action, the merger of law and equity. I or II; 4. CRIBBET.

**306. Agency and Employment.** The liabilities of employers: vicarious liability for tort; statutory liabilities for workmen's compensation, minimum wages and social security taxes. The powers of agents to contract on behalf of their principals, and the liabilities of principals and agents to each other. I or II; 3. CONARD.

**307. Personal Property.** Concept of property; distinction between real and personal property. Elements of possession including acquisition of title to wild animals; protection of mere possessory interests. Legal relations incident to finding, bailments, liens, and pledges. Acquisition of ownership by adverse possession, accession, confusion, judgment and satisfaction of judgment, and gift. Fixtures. Emblements. I or II; 2. FALETTI.

**308. Estates in Land.** Feudal tenures; seisin and possession; common-law estates and nonpossessory interests in land; Statute of Uses; creation of estates, fee simple, fee conditional, fee tail, determinable fees, life estates, estates for years, concurrent estates; modes of conveyance at common law, under Statute of Uses, and under modern statutes. I or II; 2. SUMMERS.

**309. Criminal Law.** The sources and purposes of the criminal law; the meaning of criminal responsibility; the characteristics of particular crimes. I or II; 3. HARNO.

**310. Constitutional Law.** The apportionment of governmental power between the United States and the states, and the limitations on power resulting from the contract, equal protection, and due process clauses. I or II; 4. SULLIVAN.

**311. Development of the Common Law.** A study of the sources of the common law; feudalism and its effect upon land law and family law; history of the development of the courts, the origins of the jury, role and origin of equity. A further purpose of the course is to acquaint the student with the writings of such authors as Holdsworth, Maine, Maitland, and Pollock. I or II; 3. ERICKSON.

**312. American Constitutional Development.** A study of American constitutional history from Colonial America to the present time; the writing of the constitution; the constitution in a changing social and economic scene; the role of the courts in the development of constitutional law. I or II; 3. FREIDEL.

**314. Legislation.** A study of legislative policies and procedures, of legislation as a source of law, of types of statutes, their structure, and of the problems of interpretation. I or II; 3. COHN.

**315. Legal Writing A.** Critical and intensive training in the use of legal language; exposition of legal and related materials, with emphasis on individual assignments. I; 2. COHN.

**316. Legal Writing B.** Continuation of Law 315. II; 2. COHN.

**321. Bills and Notes.** Formal requisites of negotiability of bills; checks and notes; methods of transfer; bona fide purchase; rights and liabilities of parties. I or II; 3. BRITTON, HOLT.

**322. Sales.** A study of rights and duties of parties under contracts relating to the sale of chattels, including the following problems and topics: transfer of the property interest in the subject matter of the contract; acquisition of property rights by third persons in the subject matter of the contract—estoppel and fraud; negotiable documents

of title; conditional sales; trust receipts; performance of the contract; risk of loss; warranties; remedies of buyer and seller. I or II; 3. BRITTON.

324. **Business Associations.** Partnerships, corporations, and other types of business organization; how they are formed, and what rights and liabilities result. Exercises in planning business organizations and drafting documents. I or II; 3. CONARD.

325. **Pleading.** Formation of issues and exchange of information in advance of trial. I or II; 3. CLEARY.

326. **Evidence.** Principles governing the admission of evidence and the competency of witnesses. One hour each week is devoted to practice exercises. I or II; 4. CLEARY.

327. **Titles.** Adverse possession; prescription; execution of deeds; signing, sealing, acknowledgment, delivery, acceptance; subject matter, boundaries, accretion, exceptions and reservations; creation of easements by implication; covenants for title; estoppel by deed; priorities and recording systems. I or II; 2. SUMMERS.

329. **Trusts.** A study of the jural relations between trustee and beneficiary, between trustee or beneficiary and third persons, and between successive beneficiaries; the rules governing the creation of express trusts for private persons, charitable trusts, resulting and constructive trusts; the transfer or extinguishment of the equitable interest; and the termination of the trust. I or II; 4. SCHNEBLY.

333. **Persons.** Marriage, separation, and divorce, property rights of married women, contractual and tort liabilities of one spouse to the other and to third persons. I or II; 2. WEISIGER.

334. **Criminal Law Administration and Procedure.** Problems in the administration of the criminal law. A study of criminal procedure from arrest to the end of the prosecution in a court of review, with emphasis on procedure as a device for social regulation, and including an appraisal of aims and workings of probation, parole, and executive clemency. I or II; 2. HARNO.

337. **Vendor and Purchaser.** The real estate contract: Statute of Frauds, performance of the contract, marketable title, rights of parties pending transfer of title, equitable conversion, remedies, and assignment of real estate contracts. I or II; 2. CRIBBET.

351. **Insurance.** Personal and property insurance: formation of the insurance relation; concealment, warranties, representations; insurable interest; conditions; subrogation; waiver and estoppel; incontestability, the respective interests of the beneficiary, insured, insurer, assignee, and creditor, and facts constituting maturity in life, accident, fire, theft, liability, and collision policies. I or II; 3. GOBLE.

352. **Restitution.** Contractual and quasi-contractual remedies (both legal and equitable) available because of duress, fraud, innocent misrepresentation, mistake, illegality, and economic compulsion in the formation and discharge of contracts and other transactions. I or II; 3. CARLSTON.

353. **Use of Law Books.** Practice in the library in the use of statutes, reports, digests, encyclopedias, annotated cases, citation books, reference tables, indices, and textbooks. I or II; 1. WEISIGER.

354. **Seminar in the Legal Profession.** A study of the traditions and ethics of the bar with special reference to modern controversies. I or II; 1. HARNO.

356. **Municipal Corporations.** Creation and organization; powers; liability on contracts and in tort; property rights; revenue and indebtedness. I or II; 2. KNEIER.

357. **Rights in Land.** Natural rights, profits, licenses, easements, covenants, rents, and waste. I or II; 3. SUMMERS.

358. **Oil and Gas.** Nature of the property interests in oil and gas; legal interests created by oil and gas leases; validity of leases; the habendum clause; the drilling and rental clauses; assignments of the interest of the lessor and the lessee; rents and royalties. I or II; 2. SUMMERS.

360. **Public Utilities.** Obligations of public utilities to serve without discrimination; reasonable rates; duty to extend facilities; the liability of the carrier of passengers and freight. I or II; 2. FALETTI.

361. **Mortgages.** A study of chattel and real estate mortgages, and conditional sales. I or II; 3. HOLT.

362. **Suretyship.** Suretyship, guaranty, and the accommodation contracts of negotiable instruments. I or II; 2. HOLT.

363. **Creditors' Rights.** Remedies of the delinquent debtor and his creditors—at law, in equity, and under the Bankruptcy Act; liquidation and rehabilitation; exercises in bankruptcy procedures. I or II; 3. CONARD.

364. **Corporation Finance.** Methods of financing corporations, as affected by corporation laws, securities regulation, and tax burdens. Research projects on various problems in the field of business organization. I or II; 3. CONARD.

365. **Trials and Appeals.** Litigation from process through appeal, excluding pleading and evidence. I or II; 3. BOWMAN.

366. **Legal Drafting and Office Practice.** A practical course on the drafting of legal documents; a study of the organization and management of a law office. I, II; 2. BRITTON, THOMAS.

367. **Problems and Procedures in Office Practice.** A practical course in preparation for negotiations, office conferences, and settlement procedures, with the emphasis on particular areas of the practice. I or II; 2. STAFF.

369. **Wills and Administration.** Making, revocation, revival, and republication of wills; descent; administration of estates. I or II; 3. FALETTI, SCHNEBLY.

370. **Future Interests and Restraints Upon Alienation.** A study of the various types of future interests in real and personal property recognized by law, and of the rules which determine the validity and effect of future limitations; of restraints upon the alienation of property interests; and trusts for the accumulation of income. I or II; 4. Prerequisite: Law 329. SCHNEBLY.

372. **Trade Regulation.** Problems of the businessman, common-law restraint of trade, antitrust laws, fair trade practices, trademarks, price discrimination, Federal Trade Commission. Emphasis will be placed upon the technique of handling problems in this field. I or II; 3. CARLSTON.

373. **Conflict of Laws.** Problems from conflict of laws in jurisdiction of courts; foreign judgments; torts and workmen's compensation acts; contracts; sales and mortgages; family law; administration of estates; business organizations. I or II; 4. HOLT.

375. **Federal Taxation.** Federal income tax: constitutional background; what constitutes income as distinguished from gifts, etc.; whose income it is in relation to benefits and control; when is income realized or expenses deductible; when does income arise in connection with corporate distributions and reorganizations; capital gains and losses; deductions and credits; special problems relating to classes of taxpayers. Federal estate and gift taxes and brief reference to state inheritance taxes. General problems of tax practice and procedure. I or II; 3. YOUNG.

376. **State and Local Taxation.** Proper and improper purposes of taxation. General property tax and tax administration: levy, return, assessment; various problems of assessment; collection of taxes and taxpayers' remedies. Excise taxes: general nature; excise taxes on business concerns and transactions. Jurisdiction for purposes of general property and death taxes. I or II; 2. YOUNG.

377. **International Law.** A study of special phases of international law, including its nature, sources, and subjects; jurisdiction and territory; law of treaties; treatment of aliens and law of international claims; pacific settlement of international disputes; and current developments. I or II; 3. CARLSTON.

378. **Jurisprudence.** Nature of the law, legal methods, and the judicial process; review of the various theories of law and schools of jurisprudence and philosophy of the law; relation of law and social science. I or II; 3. CARLSTON.

379. **Administrative Law.** The functions of administrative tribunals in federal, state, and municipal government, the procedure before such administrative tribunals, and judicial relief from administrative decsions. I or II; 3. SULLIVAN.

380. **Labor Law.** Same as Labor and Industrial Relations 380. The law of industrial relations with special emphasis on recent cases and legislation; collective bargaining and

labor contracts; wages and hours legislation; unemployment compensation. I or II; 3. SULLIVAN.

381. **Seminar: Commercial Paper.** Problems in commercial paper; a study of commercial paper with emphasis on the integration of the various business transactions that are related thereto and on the impact of legal sanctions on these transactions. The course involves a critical study of the Uniform Commercial Code. II; 2. BRITTON.

382. **Seminar: Problems of Business Organization.** Study of cases and statutes in various fields of business organization, accompanied by the execution of individual research projects related to the field of study. I or II; 2. CONARD.

384. **Seminar: The Legislative Processes.** Analysis of the legislative processes in the Congress and the state legislatures, the growth of statutory law; assigned problems for individual research and bill-drafting, with emphasis on the development of professional skills in this field. I or II; 2. COHN.

385. **Probate Practice.** Consideration of the more common steps in probate proceedings, with practice in the use of forms and court appearances. I or II; 1. BOWMAN.

386. **Seminar: Federal Taxation Problems I.** Tax problems relating to the form of business organization, business operations, and various business and investment transactions. Research projects on related problems. I; 2. Prerequisite: Law 375. YOUNG.

387. **Seminar: Federal Taxation Problems II.** Income, estate, and gift tax problems in estate planning and estate administration, including the operation of trusts; appraisal of estate and gift tax system and study of proposal to integrate the federal income, estate, and gift taxes. Research projects on related problems. II; 2. Prerequisite: Law 375. YOUNG.

390. **Practice Court.** Practice work in the conduct of litigation. Actual courtroom conditions are simulated. II; 2. CLEARY.

391. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

392. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

393. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

394. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

395. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

396. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

399. **Research in Special Topics.** Individual research on a special problem selected in consultation with the instructor. I, II; 1 to 4.

# LIBRARY SCIENCE

*Professors:* R. B. Downs (Director of Library School), Anne M. Boyd (Emerita), A. H. Lancour, P. L. Windsor (Emeritus).

*Associate Professors:* L. E. Bamber, Ethel Bond (Emerita), L. W. Dunlap, Thelma Eaton, H. Goldhor, Josie B. Houchens, A. M. McAnally, Rose B. Phelps, Frances Simpson (Emerita).

*Assistant Professors:* Marie M. Hostetter, M. Alice Lohrer, C. W. Stone.

*Instructors:* Donna D. Finger, Viola L. James.

*Assistants:* V. Marie Ballew, A. Kathryn Oller, Jo Ann Wiles.

## Courses for Undergraduates

**195. Introduction to Library Use.** Use of the card catalog, periodical indexes, encyclopedias and dictionaries, and other reference books. Intended for freshmen and sophomores; not for students in the Library School. I, II; 2.

## Courses for Advanced Undergraduates

**201. Use of Books and Libraries.** This course presents practical information on the use of the classification and the card catalog, printed indexes, bibliographies, and reference books, and is designed to teach the students to use books and libraries intelligently and skillfully. I; 3. Phelps.

**202. The Library in the Social Order.** The origin and historical development of the library as a product of the civilization of which it is a part, with special reference to the purposes and readers served, the materials collected, the personnel, bibliographical apparatus, and physical plant. II; 3.

**251. Organization and Operation of Libraries I.** Designed to give the student an understanding of the basic functions of the modern library, from the point of view of the professional librarian. The functions of supervising library operations and of building and maintaining library collections are considered. I; 3. Lohrer.

**252. Organization and Operation of Libraries II.** The organization and arrangement of materials in a modern library. Cataloging methods and classification schemes are studied and practiced. II; 3. Eaton.

**253. Organization and Operation of the School Library.** Objectives and methods of service in the small school library—elementary or secondary; organization; budget and book ordering; classification and simplified cataloging; training the pupil staff; housing and equipment; training the student to use the library. S; 3. James.

## Courses for Advanced Undergraduates and Graduates

**301. Literature of the Humanities and Social Sciences.** The purpose of this course is to increase the student's knowledge of the scope and significant characteristics in the literature of the social sciences and the humanities by systematic study of modern trends, themes, and representative materials. Provides an introduction to each field, and emphasizes development of skills in selection in relation to library problems and processes. I; 3 hours, or 1 unit. Dunlap.

**302. Literature of Science and Technology.** A survey of the several fields of pure and applied science and a study of the literature of each field. Designed to give the student an understanding of the content of each of the scientific disciplines and its role and place in modern society. Selected readings from the oustanding works in each field will acquaint the student with the principal sources. II; 3 hours, or 1 unit. Dunlap.

**303. Library Materials for Children.** The selection and use of library materials for children in public and school libraries according to the needs of the child in his physical, mental, and emotional development, and the purposes of the elementary school

program. The student becomes acquainted with the standard book selection aids for children and with all types of printed and audio-visual materials, and develops the ability to select and describe children's library materials according to their developmental uses. I, II; 3 hours, or 1 unit. HOSTETTER, LOHRER.

**304. Library Materials for Adolescents.** The selection and use of library materials for adolescents in school and public libraries and community organizations. The course aims to develop the ability to select and evaluate a wide variety of reading materials from standard bibliographies for the adolescent according to his personal and school needs. I, II; 3 hours, or 1 unit. HOSTETTER, LOHRER.

**306. Maps and Cartobibliographical Aids.** An examination of the problems involved in the cataloging, classification, and care of maps. The student will become acquainted with the major cartobibliographical and related aids in the field. II; 2 hours, or ½ unit. WOODS.

## MANAGEMENT

**(See Business Organization and Operation)**

## MARKETING

**(See Business Organization and Operation)**

# MATHEMATICS

*Professors:* S. S. CAIRNS (Head of Department), R. BAER, H. W. BAILEY, D. G. BOURGIN, H. R. BRAHANA, R. D. CARMICHAEL (Emeritus), A. B. COBLE (Emeritus), M. M. DAY, J. L. DOOB, A. EMCH (Emeritus), P. W. KETCHUM, W. G. MADOW, H. J. MILES, T. NAKAYAMA, A. H. TAUB, E. J. TOWNSEND (Emeritus), W. J. TRJITZINSKY.

*Associate Professors:* OLIVE C. HAZLETT (on leave), G. P. HOCHSCHILD, H. LEVY, C. W. MENDEL, G. E. MOORE, J. W. PETERS.

*Assistant Professors:* BEULAH M. ARMSTRONG, W. F. ATCHISON, P. T. BATEMAN, C. R. BLYTH, O. K. BOWER, JOSEPHINE H. CHANLER, H. CHERNOFF, W. A. FERGUSON, M. K. FORT, JR., V. A. HOERSCH, F. E. HOHN, J. LANDIN, H. LASS, B. E. MESERVE, JOSEPHINE M. MITCHELL, M. E. MUNROE, ECHO D. PEPPER, R. E. PINGRY, I. REINER, L. SCHOENFELD, E. J. SCOTT, L. L. STEIMLEY, H. E. VAUGHAN, W. WILSON.

*Instructors:* M. D. DAVIS, CORINNE R. HATTAN, M. JERISON, C. PHILLIPS, JEWELL E. SCHUBERT.

*Assistants:* R. J. ARTHUR, W. C. BENNEWITZ, L. C. BUTLER, M. P. EMERSON, A. V. FEND, J. E. FLANAGAN, H. FLESCH, L. R. FORD, JR., H. H. FOX, D. M. FRIEDLEN, D. B. GILLIES, R. T. GREGORY, C. B. HANNEKEN, D. G. HIGMAN, J. H. HORNBACK, M. KADOYAMA, C. L. KELLER, R. J. MALACH, BEVERLY A. MARSHALL, W. A. MICHAEL, JR., M. W. MILLIGAN, E. R. MULLINS, W. R. ORTON, JR., D. A. PAGE, P. R. PEABODY, R. E. PRIEST, J. W. ROLLEY, J. U. RUSSELL, JEAN E. SAMMET, F. S. SCALORA, L. L. SCOTT, R. J. SILVERMAN, R. W. SLOAN, L. J. SNELL, R. W. STROW, J. W. TOOLE, J. H. TURNOCK, G. F. VAUGHN, S. E. WALKLEY, M. J. WALSH, H. S. WOLF.

### Major in Mathematics

**Major:** Twenty hours in mathematics, excluding courses with numbers less than 130 and including two courses chosen from Mathematics 311, 312, 317, 318, 327, 328, 347, 348.

**Minors:** Twenty hours selected from one or two of the following subjects: accountancy, astronomy, chemistry, economics, philosophy, physics, psychology, statistics (Mathematics

161, 361, 362, 363, 364, 371, 372, 375, 376 377), surveying, theoretical and applied mechanics. If two subjects are chosen, at least eight hours must be taken in each.

NOTE: For undergraduate students intending to take advanced work or a major in mathematics, the following outline of freshman and sophomore work is suggested: Freshman year: first semester, Mathematics 111 or 112, and 114 or 115; second semester, Mathematics 122. Sophomore year: first semester, Mathematics 132; second semester, Mathematics 142.

Students preparing to teach high school mathematics should consult with Dr. J. W. Peters, 253 Mathematics Building, concerning their programs at the earliest possible moment on entering the University.

## Major in Statistics

**Major:** Twelve hours beyond the calculus including Mathematics 315, 347, 363, and three other hours of 300 courses in statistics in the Department of Mathematics.

**Minor:** Twenty hours in an area of application of statistics. Of these twenty hours not more than nine can be in statistical methods, and Mathematics 161 may be taken as three of these hours. The courses not emphasizing statistical methods should be chosen so that courses on the 400 level can be taken if the student enters graduate work.

## Courses for Undergraduates

**101. Basic Mathematics.** A systematic presentation of the fundamentals of arithmetic, algebra, plane geometry, trigonometry, and statistics. Required of students in the general curriculum of the College of Liberal Arts and Sciences whose entrance credits do not include one year of algebra and one year of plane geometry. I, II; 3.

**102. Basic Mathematics.** Continuation of Mathematics 101. I, II; 3. Prerequisite: Mathematics 101.

**104. Elements of Algebra and Trigonometry.** For premedical students who have entered with only one unit of high school algebra and who need credit in trigonometry as a prerequisite to physics. This course does not serve as a prerequisite for Mathematics 122. Premedical students who enter with 1½ units of algebra must take Mathematics 114. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: High school algebra, 1 unit; plane geometry, 1 unit.

**106. Solid Geometry.** Satisfies deficiency in solid geometry for engineering students; all other students receive full credit. I, II; 3. Prerequisite: Entrance algebra, 1 unit; plane geometry, 1 unit.

**111. Algebra.** I, II; 5. Students having 1½ entrance units in algebra receive only 3 hours credit. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Entrance algebra, 1 unit; plane geometry, 1 unit.

**112. College Algebra.** I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

**114. Plane Trigonometry.** I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Entrance algebra, 1½ units, or registration in Mathematics 111; plane geometry, 1 unit.

**115. Advanced Trigonometry.** Intended for students having entrance credit in trigonometry. The course will include such topics as trigonometric equations, De Moivre's theorem, complex numbers with applications to more complicated problems in plane trigonometry, and a brief introduction to spherical trigonometry. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; Mathematics 114, or entrance trigonometry, ½ unit.

**117. Combined Freshman Mathematics.** A combined course integrating all the usual topics of algebra, trigonometry, and analytic geometry, and also some topics of differential calculus. For students of architecture, chemistry, chemical engineering, ceramic engi-

neering, and ceramics. I, II; 5. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

122. **Analytic Geometry.** Plane and solid analytic geometry. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Mathematics 111 or 112, and 114 or 115.

123. **Analytic Geometry.** Plane and solid analytic geometry. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Mathematics 111 or 112, and 114 or 115.

127. **Combined Freshman Mathematics.** Continuation of Mathematics 117. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Mathematics 117.

132. **Calculus.** First course for students of mathematics and engineering. I, II; 5. Prerequisite: Mathematics 122.

137. **Calculus.** For students of architecture, chemistry, chemical engineering, ceramics, and ceramic engineering I; 3. Prerequisite: Mathematics 117 and 127, or consent of department.

142. **Calculus.** Second course for students of mathematics and engineering. I, II; 3. Prerequisite: Mathematics 132.

147. **Calculus.** Continuation of Mathematics 137. II; 3. Prerequisite: Mathematics 137.

161. **Statistics.** I, II; 3. Prerequisite: Mathematics 111 or 112; sophomore standing.

171. **Mathematics of Finance.** A study of simple and compound interest, simple and compound discount, annuities, and applications to various problems in finance. II; 3. Prerequisite: Mathematics 132. Offered in alternate years.

## Courses for Advanced Undergraduates

202. **Arithmetic for Teachers.** Open only to students in the curriculum in elementary education. Credit is not allowed students in the College of Liberal Arts and Sciences. I, II; 5. Prerequisite: Senior standing.

205. **Teachers' Course.** I, II; 3. Prerequisite: A year of calculus, or consent of instructor.

222. **Advanced Aspects of Euclidean Geometry.** I, II; 3. Prerequisite: Eighteen hours of mathematics, including Mathematics 132 and 142.

291. **Thesis and Reading Course.** I; 2. Prerequisite: Twenty-four hours of college mathematics. STAFF.

292. **Thesis and Reading Course.** II; 2. Prerequisite: Twenty-four hours of college mathematics. STAFF.

## Courses for Advanced Undergraduates and Graduates

301. **Fundamental Concepts of Mathematics.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

302. **Fundamental Concepts of Mathematics.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

303. **Foundations of Mathematics.** The process of proof applied to some fundamental domains of mathematics, and a discussion of recent criticisms of the foundations of mathematics. I; 3 hours, or 1 unit. Prerequisite: Major in mathematics, or consent of instructor. VAUGHAN.

304. **Foundations of Mathematics.** Continuation of Mathematics 303. The process of proof applied to some fundamental domains of mathematics, and a discussion of recent criticisms of the foundations of mathematics. II; 3 hours, or 1 unit. Prerequisite: Mathematics 303. VAUGHAN.

311. **Advanced Algebra.** For students interested in actuarial science, statistics, or teacher training in mathematics. I; 3 hours, or 1 unit. Prerequisite: Mathematics 142, or consent of instructor.

312. **Advanced Algebra.** For students interested in actuarial science, statistics or teacher training in mathematics. II; 3 hours, or 1 unit. Prerequisite: Mathematics 142, or consent of instructor.

315. **Linear Transformations and Matrices.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 142.

317. **Introduction to Higher Algebra.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

318. **Introduction to Higher Algebra.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 317.

327. **Introduction to Higher Geometry.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142 or 147.

328. **Introduction to Higher Geometry.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 327.

332. **Topological Spaces.** I, II; 3 hours, or 1 unit. Prerequisite: Credit or registration in Mathematics 347.

333. **Combinatorial Topology.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

341. **Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

342. **Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 341.

343. **Advanced Calculus.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

345. **Differential Equations and Orthogonal Functions.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

347. **Introduction to Higher Analysis: Real Variables.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343, or consent of instructor.

348. **Introduction to Higher Analysis: Complex Variables.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 347.

349. **Introduction to Higher Analysis: Real Variables II.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 347.

353. **Elementary Theory of Numbers.** I; 3 hours, or 1 unit. Prerequisite: Credit or registration in Mathematics 317 or 347.

354. **Elementary Theory of Numbers.** Continuation of Mathematics 353. II; 3 hours, or 1 unit. Prerequisite: Mathematics 353.

358. **Mathematics for Social Scientists.** This course will present the topics of the differential and integral calculus that are most important for students of the social sciences and will use exercises drawn from those fields. Some topics from trigonometry and analytic geometry will also be included. I; 3 hours, or ½ unit. Prerequisite: Mathematics 111 or 112.

359. **Mathematics for Social Scientists.** Description the same as for Mathematics 358. II; 3 hours, or ½ unit. Prerequisite: Mathematics 358.

361. **Theory of Probability.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147. MUNROE.

362. **Finite Differences.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142. Offered in 1952-1953 and in alternate years. PETERS.

363. **Advanced Statistics.** Probability and statistical inference. I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142. CHERNOFF.

364. **Advanced Statistics.** Probability and statistical inference. II; 3 hours, or 1 unit. Prerequisite: Mathematics 363. CHERNOFF.

366. **Theory of Sample Surveys.** The development of the formulae to be used in the efficient planning of sample surveys and the interpretation of the results. I, II; 3 hours, or 1 unit. Prerequisite: Calculus or Mathematics 112 and a first course in statistics. MADOW.

367. **Practice of Sample Surveys.** Training in planning and making sample surveys; how the results are interpreted. One or more sample surveys will be planned in detail. I, II; 3 hours, or 1 unit. Prerequisite: Calculus or Mathematics 112 and a first course in statistics. MADOW.

369. **The Ideas and Methods of Statistics.** The modern formulation of the ideas of statistical inference with applications to the testing of various statistical hypotheses. The treatment will stress not the details but the general nature of proofs. The interpretation of the ideas in practice will be given. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 111 or 112 and a course in statistics. MADOW.

370. **The Ideas and Methods of Statistics.** Continuation of Mathematics 369. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 369. MADOW.

371. **Actuarial Theory.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147. PETERS.

372. **Actuarial Theory.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 371. PETERS.

375. **Nonparametric Inference.** Nonparametric tests of hypotheses concerning means, variances, regression, and correlation coefficients. Methods depending on ranks. The efficiency of nonparametric tests. I or II; 3 hours, or 1 unit. Prerequisite: Mathematics 361 or 363.

376. **Parametric Inference.** Introduction to the theories of estimation, testing hypotheses, and decision functions with respect to the parameters of distributions. The contributions of R. A. Fisher, J. Neyman, and A. Wald. The theory of the characteristic function will be introduced as needed. I or II; 3 hours, or 1 unit. Prerequisite: Mathematics 361 or 363.

377. **Sequential Inference.** An introduction to quality control, sampling, inspection, and sequential analysis with particular emphasis on the latter; control charts; single, double, and multiple sampling inspection methods; sequential probability ratio tests; efficiency of sequential tests; expected number of observations necessary; operating characteristics and average sample number curves. I or II; 3 hours, or 1 unit. Prerequisite: Mathematics 363.

381. **Vector and Tensor Analysis.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142 and 343, or equivalent, or consent of instructor.

382. **Vector, Tensor, and Matrix Methods in Applied Mathematics.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 381, or consent of instructor.

385. **Theory of High-Speed Computing Machines.** The logical design of various types of high-speed computing machines. The preparation of problems for such machines. I, II; 3 hours, or 1 unit. Prerequisite: Senior standing; consent of instructor.

386. **Laplace Transforms.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

387. **Introduction to Numerical Methods.** I or II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

388. **Mathematical Methods in Engineering and Science.** I or II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

389. **Ordinary Non-Linear Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343 and 311 or 345.

# MECHANICAL ENGINEERING

*Professors:* N. A. Parker (Head of Department), C. H. Casberg (Emeritus), W. N. Espy, J. R. Fellows, C. W. Ham (Emeritus), W. L. Hull, S. Konzo, A. P. Kratz (Emeritus), E. Laitala, R. F. Larson, O. A. Leutwiler (Emeritus), J. A. Polson (Emeritus), J. H. Potter, D. G. Ryan, H. J. Schrader (cooperating), W. H. Severns (on leave), K. J. Trigger, A. C. Willard (Emeritus).

*Associate Professors:* E. L. Broghamer, D. H. Cole, C. D. Greffe, G. W. Harper, J. A. Henry, H. H. Korst, D. H. Krans, E. D. Luke, R. J. Martin, J. C. Miles, L. C. Pigage, C. E. Schubert, F. Seyfarth.

*Assistant Professors:* H. D. Bareither, E. S. Buffa, J. R. Carroll, L. E. Doyle, E. F. Hebrank, J. L. Leach, D. E. McFeron, C. J. Starr, L. M. Zubko.

*Instructors:* J. W. Bayne, C. E. Derrough, R. B. Dillaway, W. J. Love, C. H. McClay, A. E. Noreen, D. H. Offner, M. B. Singer, C. L. Sonnenschein, W. F. Stoecker, R. P. Strout, J. L. Whisenand, A. D. Wright.

*Assistants:* T. W. Bayler, A. O. Davis, A. R. Konecny, W. K. Mueller, R. H. Page, H. E. Straub.

## Courses for Undergraduates

**171. Mechanism.** A study of the transmission and modification of motion by linkwork, cams, gears, belts, ropes, chains, etc.; theory of gear tooth action; gear tooth systems and production methods; point paths; displacement diagrams. I, II; 2. Prerequisite: General Engineering Drawing 101; registration in Physics 103. Greffe, Seyfarth, Stone.

**181. Metal Processing.** Basic machining processes used for metal processing. Use of machine tools, jigs, fixtures, gauges, and measuring instruments and inspection methods to produce interchangeable metal parts. I, II; 4. Prerequisite: Sophomore standing; General Engineering Drawing 101 or 104. Derrough, Doyle, G. F. Schrader, and others.

**182. Manufacturing Processes.** Foundry practice, pattern design; hot and cold forming; welding and allied processes; machine tools and machining practice; use of jigs, fixtures, and tools for manufacture of interchangeable parts. Classroom discussion and demonstration. I, II; 3. Prerequisite: Sophomore standing in aeronautical engineering, or consent of instructor. Leach, G. F. Schrader.

**183. Materials Casting.** Casting as a process of fabrication; the molding process including machine molding; molding sand characteristics, control, and testing; melting and pouring practice. Physical characteristics of cast materials, advantages and disadvantages; gray iron structures and elementary metallurgical concepts; design of wood and metal patterns and correlation with foundry practice; core requirements control and testing. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; sophomore standing. Leach, Schubert, Wright.

**184. Metal Processing.** Basic machining processes used for metal processing. Use of machine tools, jigs, fixtures, gauges, and measuring instruments and inspection methods to produce interchangeable metal parts. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; sophomore standing. Derrough, Doyle, G. F. Schrader, Starr, and others.

## Courses for Advanced Undergraduates

**191. Mechanical Power Equipment.** Theory, construction, and operating characteristics of boilers, prime movers, air compressors, fans, and auxiliaries. For civil engineering students. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. Dillaway, Miles, and others.

**202. Thermodynamics.** Energy of engineering systems and transformation of energy; properties of thermodynamic media; energy relationships for non-flow and steady-flow processes; power and refrigeration cycles; air compression; and heat transfer. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. LUKE, ZUBKO, and others.

**203. Power Plant Equipment.** Central station equipment including steam generators, steam turbine and engines, internal combustion engines, and auxiliaries. For electrical and general engineering students. I, II; 3. Prerequisite: Mechanical Engineering 202. HEBRANK, MCCLAY, NOREEN, and others.

**204. Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. For chemical and electrical engineering students. I, II; 2. Prerequisite: Mechanical Engineering 201; Mechanical Engineering 203, or Chemical Engineering 370. CARROLL, HEBRANK, KRANS, MILES, and others.

**205. Thermodynamics.** Energy and its transformations; properties of thermodynamic systems; non-flow and steady-flow processes of fluids; reversibility and limitations; behavior of gases, liquids, and vapors; entropy and the second law; thermodynamic temperature scales and heat engines. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. BAREITHER, COLE, ESPY, LUKE, and others.

**206. Thermodynamics.** Analysis of steady flow of fluids in pipes, nozzles, orifices, power plant equipment; air compressor, blower, fan and Pitot tube energy relations; detailed analysis of simple steam engines and turbines; power and refrigeration cycles; thermodynamic properties of moist air and applications in air-conditioning processes. I, II; 3. Prerequisite: Mechanical Engineering 205. ESPY, KRANS, LARSON, LUKE, and others.

**207. Power Plant Equipment.** Function and performance of steam power equipment, internal combustion engines, fluid handling equipment, and their auxiliaries. I, II; 3. Prerequisite: Registration in Mechanical Engineering 206. FELLOWS, HEBRANK, HENRY, KRANS, and others.

**208. Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. I, II; 3. Prerequisite: Mechanical Engineering 203, or registration in Mechanical Engineering 206 and 207. BAREITHER, HEBRANK, HENRY, KRANS, and others.

**221. Mechanics of Machinery.** Linkages, cams and gears; belts, ropes, and chains; velocities, accelerations, and inertia forces in machines; vibrations and critical speeds; balancing of engines; principle of the gyroscope. I, II; 5. Prerequisite: Registration in Theoretical and Applied Mechanics 211. RYAN and others.

**222. Mechanics of Machinery.** A study of masses, motions, and forces in machines, with the application of graphical and analytical methods; velocities; accelerations; static forces; inertia forces; balancing; vibrations and critical speeds in shafts; principle of the gyroscope. I, II; 3. Prerequisite: Junior standing in aeronautical engineering. BROGHAMER and others.

**223. Mechanics of Machinery.** A study of masses, motions, and forces in machines, with the application of graphical and analytical methods; velocities; accelerations; static forces; inertia forces; balancing; vibrations and critical speeds in shafts; principle of the gyroscope. I, II; 3. Prerequisite: Mechanical Engineering 171; Theoretical and Applied Mechanics 211 or 156. BROGHAMER and others.

**224. Design of Machine Elements.** Application of the principles of mechanics and physical properties of materials to the proportioning of machine elements, including consideration of function, production, and economic factors. I, II; 3. Prerequisite: Mechanical Engineering 223; Theoretical and Applied Mechanics 221; registration in Theoretical and Applied Mechanics 223. BAYNE and others.

**231. Advanced Metal Processing.** Introduction to the theory of metal cutting and quantity production methods with experiments on machine tool performance, cutting tool analysis, production and specialized machinery, production planning and estimating, and production problems. I, II; 3. Prerequisite: Mechanical Engineering 184; credit or registration in Mechanical Engineering 224. DERROUGH, DOYLE, G. F. SCHRADER, STARR, and others.

232. **Motion and Time Study.** Principles of motion economy affecting design of product, work place layout, and tools and equipment used in manufacture. Necessity for time study and principles of determining time standards. Standard data. Applications for time standards. I, II; 3. Prerequisite: Mechanical Engineering 184; junior standing. BUFFA, PIGAGE.

233. **Industrial Quality Control.** Shewhart control chart techniques, acceptance sampling, rationalization of tolerances and specifications, organization and administration of quality programs. I, II; 3. Prerequisite: Junior standing in engineering. HENRY.

234. **Heat Treatment of Metals.** Effects of heat treatment upon physical properties and structure of metals; heat treating operations; study of structures and physical properties; hardenability, grain size, machinability as affected by structure. Selection and heat treatment of steels based on performance requirements. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 221; registration in Mechanical Engineering 205, 224, and Theoretical and Applied Mechanics 223. MCFERON, TRIGGER, and others.

235. **Industrial Safety.** Detailed study of the principles of industrial and related accident prevention and application. Course is designed to provide a sound working knowledge of safety principles for the student interested in the design or the manufacture of a product and for the student interested in entering the field of safety engineering in industry. I, II; 3 hours. Prerequisite: Junior standing. HARPER and others.

251. **Mechanical Equipment of Buildings.** Laboratory tests of mechanical equipment such as turbines, fans, boilers, etc. I, II; 1. Prerequisite: Registration in Mechanical Engineering 252; junior standing. FELLOWS, HILL, G. E. MARTIN.

252. **Heating and Ventilating for Architectural Engineers.** Definition of essential units, use of steam tables, factors affecting human comfort, estimation of heating and cooling loads, study of the various types of warm air, steam, and hot water heating systems. Study of the fundamentals of ventilation and air conditioning; panel heating and automatic controls. I, II; 4. Prerequisite: Registration in Mechanical Engineering 251; junior standing. FELLOWS.

253. **Heating and Ventilating for Architects.** Definition of essential units, use of steam tables, factors affecting human comfort, study of the various types of heating systems, application and selection of fans, automatic control of heating systems. I, II; 2. Prerequisite: Senior standing. FELLOWS.

254. **Heat Transfer.** Principles and practice of heat transfer; conduction, radiation, natural and forced convection, boiling liquids, condensing vapors, heat exchanger design, insulation, unsteady state heat transfer. I, II; 3. Prerequisite: Mechanical Engineering 202 or 205. HENRY, KRANS, LARSON, ZUBKO.

255. **Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. I, II; 3. Prerequisite: Mechanical Engineering 206, 207, and 208. KRANS, NOREEN, STROUT, ZUBKO, and others.

256. **Internal Combustion Engines.** A study of the fundamental principles underlying the theory and analysis of piston-type internal combustion engines. I, II; 3. Prerequisite: Mechanical Engineering 206. HULL, MILES, NOREEN.

257. **Gas Turbines.** A study of the theoretical and design aspects of the components of the combustion gas turbine. I, II; 3. Prerequisite: Mechanical Engineering 234 and 254; Theoretical and Applied Mechanics 232. HULL, LARSON, and others.

258. **Combustion Engine and Turbine Laboratory.** Basic laboratory work in combustion, fuels, lubrication, internal combustion engines, and gas turbines. I, II; 3. Prerequisite: Mechanical Engineering 256. HULL and others.

259. **Refrigeration Engineering.** The theory of operation, design, and selection of mechanical refrigeration equipment; the application of refrigeration systems to industrial cooling. I, II; 3. Prerequisite: Mechanical Engineering 206. R. J. MARTIN.

260. **Heating, Ventilating, and Air Conditioning.** Heating and cooling loads; hot-water, steam, and warm-air heating, including equipment selection and control of systems; fuels and burners; air-conditioning systems, including equipment selection and

processes. I, II; 3. Prerequisite: Registration in Mechanical Engineering 255. CARROLL, FELLOWS.

261. **Heating, Ventilating, and Air-Conditioning Design.** Theory and design of heating, ventilating, and air-conditioning systems. I, II; 3. Prerequisite: Mechanical Engineering 260. CARROLL, FELLOWS, R. J. MARTIN, and others.

271. **Design of Machine Elements.** Continuation of Mechanical Engineering 224. I, II; 3. Prerequisite: Mechanical Engineering 224. BROGHAMER, RYAN, SEYFARTH, WHISENAND.

272. **Analytical Design of High-Speed Engines.** Study of the dynamics of high-speed internal combustion engines, engine balance, crankshaft deflections, torsional vibrations. I, II; 3. Prerequisite: Mechanical Engineering 223; senior standing, or consent of instructor. GREFFE.

273. **Machine Design.** Correlation of previously acquired design experience with the creative problem of developing machine parts that depend upon design judgment. I, II; 3. Prerequisite: Mechanical Engineering 271; senior standing, or consent of instructor. RYAN.

274. **Power Plant Design.** A critical study of the functions, relative performance characteristics, economics, selection, and correlation of equipment for a modern power generating station. I, II; 3. Prerequisite: Mechanical Engineering 255. BROGHAMER, GREFFE, RYAN, SEYFARTH.

281. **Manufacturing Organization and Operation.** Basic functions in an industrial organization and their interrelationship. Economic considerations involved in selection of materials, product design, or manufacturing methods to obtain high quality product at minimum cost, on schedule. Production planning and scheduling, materials control, and estimating. I, II; 3. Prerequisite: Senior standing in engineering. Credit toward graduation is not allowed for both Mechanical Engineering 281 and Management 101. LAITALA.

282. **Tool Engineering.** Planning and design of special machine tools, jigs, fixtures, dies, gauges, and cutting tools based upon forces, power requirements, tool materials, and work materials from the standpoint of economical manufacture. I, II; 3. Prerequisite: Mechanical Engineering 271. DOYLE and others.

283. **Industrial Plant Design.** Geographical location, layout, and design of industrial plants. Materials handling principles and methods. Selection and purchase of equipment. Consideration of safety, service facilities, working conditions. Laboratory work involves major problem in design and layout of industrial plant. I, II; 3. Prerequisite: Mechanical Engineering 232 and 281. BUFFA.

284. **Welding Engineering.** Study of the fundamentals of welding processes and design of weldments. Types, characteristics, and performance of various welding machines and processes; resistance welding and machine welding; inspection and testing of welds; design of weldments based upon suitable size, type, and location of welds; application to the production of machines and structures; supplemented by laboratory experiments. I, II; 3. Prerequisite: Senior standing in engineering; consent of instructor. SINGER, TRIGGER.

291. **Mechanical Engineering Seminar.** Discussion and presentation of selected topics from the current problems and literature in mechanical engineering. I, II; 1. Prerequisite: Senior standing in mechanical engineering. PARKER and others.

297. **Experimental Investigation.** Instrumentation and planning of investigations in mechanical engineering research. I, II; 3. Prerequisite: Senior standing in mechanical engineering; consent of instructor. STAFF.

298. **Thesis.** Investigation of special subjects and preparation of thesis embodying report on investigation, review of literature, and discussion of results. I, II; 3. Prerequisite: Mechanical Engineering 297. STAFF.

299. **Inspection Trip.** A two- to three-day inspection trip to a selected number of industrial installations which represent typical examples of the practice of mechanical engineering. Required of all seniors in mechanical engineering. I; no credit. Prerequisite: Senior standing in mechanical engineering. STAFF.

## Courses for Advanced Undergraduates and Graduates

**301. Engineering Thermodynamics.** Application of thermodynamics to engineering processes, with special attention to steady flow of a compressible medium in insulated or non-insulated ducts, availability of thermal energy, heat and power from combustion, methods of formulation and correlation of properties of a pure substance, and effect of equilibrium on the analysis of internal combustion engines and cycles. I, II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 205 and 206; consent of instructor. ESPY.

**303. Fuels and Combustion.** Fuel resources; composition and specification of natural and manufactured fuels; conbustion stoichiometry; fuel calorimeters; coal, oil, and gas burners; fire box and chimney design; smoke abatement. I; 3 hours, or ½ to ¾ unit. Prerequisite: Chemistry 101 and 104, or equivalent; Mechanical Engineering 207, or equivalent. Designed as an elective for students in general, heating and ventilating, and power options in mechanical engineering. FELLOWS.

**305. Thermodynamics of High-Velocity Flow.** The thermodynamics of gases during high-velocity flow within enclosed channels using Mach number as the fundamental variable. Analyses of the basic flow equations, effects of friction and plane shock theory. Application to thermodynamic cycles involving nozzles, diffusers, compressors, combustion, and turbines. I, II; 3. Prerequisite: Mechanical Engineering 206, or consent of instructor. ZUBKO.

**311. Instrumentation and Measurements.** Instruments and measuring equipment for flow, temperature, pressure, speed, and gas analysis. I, II; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. KONZO.

**314. Lubrication.** The theories of lubrication; manufacture and properties of lubricants; methods of testing; lubrication methods and appliances. A study of the lubrication requirements of machines of many kinds. I; 3 hours, or ½ to ¾ unit. Prerequisite: Undergraduate courses in machine design and fluid mechanics.

**332. Theory of Internal Combustion Engines.** Study of thermodynamics of reciprocating engine cycles, considering such factors as chemical dissociation, heat loss, combustion chamber shape, and flow through valves and manifolds. II; 3 hours, or ½ to ¾ unit. Prerequisite: Undergraduate course in internal combustion engines. HULL.

**358. Problems in Industrial Safety.** Course deals with specific safety problems such as machine guarding, industrial hygiene, use of accident-cause codes, accident costs *vs.* safety costs, plant inspection technique and practice, injury investigations, fire prevention and application of fire codes. II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 235. HARPER and others.

**361. Railway Motive Power Equipment.** A technical study of the various types of motive power used on railways with special emphasis on steam, Diesel, and electric locomotives, and secondary consideration to special types such as the steam turbine, turbo-electric, and gas turbine locomotives. I; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. H. J. SCHRADER.

**362. Railway Motive Power Operation.** A study of the conditions under which railway motive power operates. Economics of operation, present equipment, proposed new equipment, servicing and maintenance; availability; train resistance, motive power, tractive force, speed time and distance curves, preparation of time tables; problems in stopping trains; terminal and repair facilities. II; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. H. J. SCHRADER.

**371. Petroleum Production Engineering—Field Development.** Properties of petroleum, oil reservoirs, exploration and drilling methods, casing methods, and well logging. I; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering; consent of instructor. LARSON.

**372. Petroleum Production Engineering.** Study of reservoir performance, principle of oil and gas recovery, storage and transportation, and economics of oil field exploitation. II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 371. LARSON.

## METALLURGICAL ENGINEERING

(See Mining and Metallurgical Engineering)

# MILITARY SCIENCE AND TACTICS

*Professor:* Colonel M. A. HATCH (Head of Department).

*Associate Professors:* Colonel C. H. ELGES, JR.; Lieutenant Colonels T. C. ANDERSON, E. F. BERENDT, N. G. HIKEL; Majors J. T. CLARK, W. G. GRAHAM, S. R. MARCONI, W. J. WITSELL; Captains E. R. CAMPBELL, T. C. GRICE, R. W. STOWBRIDGE.

*Assistant Professors:* Major R. M. FERRELL; Captains L. E. KAUFER, J. H. MATTHEWS, JR., R. F. MAY, W. A. TONNING; Lieutenant J. T. HOEGEN.

## Courses for Undergraduates

**101. Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, military organization, military policy, evolution of warfare, maps and aerial photographs. I; 1. Prerequisite: Citizen of U.S.; physically fit. MARCONI (Director of Freshmen).

**102. Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, first aid and hygiene, weapons, and military problems of the U.S. II; 1. Prerequisite: Military Science 101, or Air Force Science 111, or equivalent approved by head of department and institution. MARCONI (Director of Freshmen).

**103. Infantry Sophomore Drill and Theory.** Basic infantry instruction to include leadership, drill and exercise of command, organization of infantry units, weapons, marksmanship, technique of fire of rifle squad, combat formations, scouting and patrolling, tactics of rifle squad. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. HIKEL, HOEGEN.

**104. Infantry Sophomore Drill and Theory.** Continuation of Military Science 103. II; 1. Prerequisite: Military Science 103, or equivalent approved by head of department and institution. HIKEL, HOEGEN.

**123. Armor Sophomore Drill and Theory.** Basic armor instruction to include leadership, drill and exercise of command, basic communications, basic motors, history and missions of armor, mechanical training with tank weapons, scouting and patrolling, and weapons. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. GRAHAM, MILLS.

**124. Armor Sophomore Drill and Theory.** Continuation of Military Science 123. II; 1. Prerequisite: Military Science 123, or equivalent approved by head of department and institution. GRAHAM, MILLS.

**133. Corps of Engineers Sophomore Drill and Theory.** Basic engineer instruction to include leadership, drill and exercise of command, history and tradition of Corps of Engineers, characteristics of weapons, camouflage, defense against chemicals, explosives and demolitions, hand tools and rigging, mines and booby traps, organization and tactics of small units, organization of the ground and field fortifications. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. MAY.

**134. Corps of Engineers Sophomore Drill and Theory.** Continuation of Military Science 133. II; 1. Prerequisite: Military Science 133, or equivalent approved by head of department and institution. MAY.

**143. Signal Corps Sophomore Drill and Theory.** Basic signal corps instruction to include leadership, drill and exercise of command introduction to signal communications,

organization and missions of Signal Corps, organization and signal communications practices of infantry, armored and airborne divisions. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. BERENDT, CAMPBELL.

144. **Signal Corps Sophomore Drill and Theory.** Continuation of Military Science 143. II; 1. Prerequisite: Military Science 143, or equivalent approved by head of department and institution. BERENDT, CAMPBELL.

153. **Quartermaster Corps Sophomore Drill and Theory.** Basic quartermaster instruction to include leadership, drill and exercise of command, organization for supply in the army, organization and functions of Quartermaster Corps, classification of supplies, use of supply catalogs and bases of allowances, property accountability and responsibility, research and development of supplies in Quartermaster Corps, organization, functions, and operation of quartermaster units, and unit and organizational supply. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

154. **Quartermaster Corps Sophomore Drill and Theory.** Continuation of Military Science 153. II; 1. Prerequisite: Military Science 153, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

163. **Antiaircraft Artillery Sophomore Drill and Theory.** Basic antiaircraft artillery instruction to include leadership, drill and exercise of command, introduction to AAA weapons, characteristics, capabilities, and limitations of AAA automatic weapons, service of the piece—automatic weapons fire unit, introduction to AAA guns, characteristics, capabilities, and limitations of 90-mm. AAA guns, and service of the piece—90-mm. AAA guns. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. GRICE, MATTHEWS.

164. **Antiaircraft Artillery Sophomore Drill and Theory.** Continuation of Military Science 163. II; 1. Prerequisite: Military Science 163, or equivalent approved by head of department and institution. GRICE, MATTHEWS.

173. **Transportation Corps Sophomore Drill and Theory.** Basic transportation instruction to include leadership, drill and exercise of command, introduction to Transportation Corps, economics of military transportation, military highway transport and highway organization and operation. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. ELGES, KAUFER.

174. **Transportation Corps Sophomore Drill and Theory.** Continuation of Military Science 173. II; 1. Prerequisite: Military Science 173, or equivalent approved by head of department and institution. ELGES, KAUFER.

183. **Army Security Agency Sophomore Drill and Theory.** Basic instruction in army security to include leadership, drill and exercise of command, organization and functions of Army Security Agency, means of signal communication, basic cryptography, radio intercept and direction finding, elementary cryptanalysis, and theory and application of traffic analysis. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. STOWBRIDGE.

184. **Army Security Agency Sophomore Drill and Theory.** Continuation of Military Science 183. II; 1. Prerequisite: Military Science 183, or equivalent approved by head of department and institution. STOWBRIDGE.

193. **Ordnance Corps Sophomore Drill and Theory.** Basic instruction to include leadership, drill and exercise of command, the role of Ordnance, automotive matériel, small arms matériel, ammunition matériel, artillery matériel, and fire control matériel. I; 1. Prerequisite: Military Science 102, or Air Force Science 112, or equivalent approved by head of department and institution. WHITESELL.

194. **Ordnance Corps Sophomore Drill and Theory.** Continuation of Military Science 193. II; 1. Prerequisite: Military Science 193, or equivalent approved by head of department and institution. WHITESELL.

## Courses for Advanced Undergraduates

205. **Infantry Junior Drill and Theory.** Advanced instruction in infantry to include leadership, drill and exercise of command, organization, weapons, gunnery, communications, combat intelligence, estimate of situation and combat orders, field fortifications, and tactics of rifle and heavy weapons platoon and companies. I; 3. Prerequisite: Military Science 104, or equivalent approved by head of department and institution. HIKEL, HOEGEN.

206. **Infantry Junior Drill and Theory.** Continuation of Military Science 205. II; 3. Prerequisite: Military Science 205. HIKEL, HOEGEN.

207. **Infantry Senior Drill and Theory.** Continuation of Military Science 206 to include command and staff communications, motors and transportation, supply and evacuation, troop movement, new developments, the military team, tactics, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 206. HIKEL, HOEGEN.

208. **Infantry Senior Drill and Theory.** Continuation of Military Science 207. II; 3. Prerequisite: Military Science 207. HIKEL, HOEGEN.

225. **Armor Junior Drill and Theory.** Advanced instruction in armor to include leadership, drill and exercise of command, communications, gunnery, motors, organization, tactics, tank driving, and troop leading. I; 3. Prerequisite: Military Science 124, or equivalent approved by head of department and institution. GRAHAM, MILLS.

226. **Armor Junior Drill and Theory.** Continuation of Military Science 225. II; 3. Prerequisite: Military Science 225. GRAHAM, MILLS.

227. **Armor Senior Drill and Theory.** Continuation of Military Science 226 to include combat intelligence, communications, gunnery, motors, new developments, supply and evacuation, tactics, tank driving, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 226. GRAHAM, MILLS.

228. **Armor Senior Drill and Theory.** Continuation of Military Science 227. II; 3. Prerequisite: Military Science 227. GRAHAM, MILLS.

235. **Corps of Engineers Junior Drill and Theory.** Advanced instruction in Corps of Engineers to include bridge design and classification, engineer signal communications, engineer combat intelligence, engineer supply, military roads and runways, organization of engineer units, organization of combat divisions, tactics of engineer units, vehicle operation and maintenance, water supply and individual weapons and marksmanship. I; 3. Prerequisite: Military Science 134, or equivalent approved by head of department and institution. Open to students pursuing any engineering curriculum or applied course such as geology, chemistry, physics, etc. MAY.

236. **Corps of Engineers Junior Drill and Theory.** Continuation of Military Science 235. II; 3. Prerequisite: Military Science 235. MAY.

237. **Corps of Engineers Senior Drill and Theory.** Continuation of Military Science 236 to include engineer support for the Air Force, the communication zone and for the type field army, command and staff, construction, utilities and job management, motor movements, river crossing operations, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 236. MAY.

238. **Corps of Engineers Senior Drill and Theory.** Continuation of Military Science 237. II; 3. Prerequisite: Military Science 237. MAY.

245. **Signal Corps Junior Drill and Theory.** Advanced signal corps instruction to include communications security, signal orders, field wire and field radio communication fundamentals, applied signal communication, message center and communication center procedure, signal supply and repair, career guidance program for Signal Corps officers, and weapons and marksmanship. I; 3. Prerequisite: Military Science 144, or equivalent approved by head of department and institution. Open to students en-

rolled in academic courses leading to a degree in engineering, electronics, or physics. Students enrolled in courses other than these may be admitted as a second priority. CAMPBELL, WHITAKER.

246. **Signal Corps Junior Drill and Theory.** Continuation of Military Science 245. II; 3. Prerequisite: Military Science 245. BERENDT, CAMPBELL.

247. **Signal Corps Senior Drill and Theory.** Continuation of Military Science 246 to include wire and radio communication matériel, higher echelon signal communication and equipment, post signal operations and administrative procedure, career guidance plan for Signal Corps officers, dark room technique and photographic practices, command and staff, combat intelligence, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 246. BERENDT, CAMPBELL.

248. **Signal Corps Senior Drill and Theory.** Continuation of Military Science 247. II; 3. Prerequisite: Military Science 247. BERENDT, CAMPBELL.

255. **Quartermaster Corps Junior Drill and Theory.** Advanced quartermaster instruction to include station and depot supply, storage, warehousing and materials handling, procurement, storage and distribution of petroleum products, commissary, post and field laundry, garrison and field bakery operations, salvage operations and procedures, maintenance and reclamation of quartermaster supplies, graves registration and mortuary activities, food service activities, and individual weapons and marksmanship. I; 3. Prerequisite: Military Science 154, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

256. **Quartermaster Corps Junior Drill and Theory.** Continuation of Military Science 255. II; 3. Prerequisite: Military Science 255. ANDERSON, FERRELL.

257. **Quartermaster Corps Senior Drill and Theory.** Continuation of Military Science 256 to include field and procurement procedures, command and staff, combat intelligence, technical intelligence, organization and functions of the combat arms and technical services, quartermaster operations in the zone of interior and theater of operations, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 256. ANDERSON, FERRELL.

258. **Quartermaster Corps Senior Drill and Theory.** Continuation of Military Science 257. II; 3. Prerequisite: Military Science 257. ANDERSON, FERRELL.

265. **Antiaircraft Artillery Junior Drill and Theory.** Advanced antiaircraft artillery instruction to include AAA tactics, basic gunnery for AAA and automatic weapons, communications, individual weapons and marksmanship, motors and transportation, organization and troop movements. I; 3. Prerequisite: Military Science 164, or equivalent approved by head of department and institution. GRICE, MATTHEWS.

266. **Artillery Junior Drill and Theory.** Continuation of Military Science 265. II; 3. Prerequisite: Military Science 265. GRICE, MATTHEWS.

267. **Antiaircraft Artillery and Senior Drill and Theory.** Continuation of Military Science 266 to include AAA matériel and advanced tactics, command and staff, combat intelligence, gunnery, military team, new developments, supply and evacuation, field artillery capabilities and employment, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 266. GRICE, MATTHEWS.

268. **Artillery Senior Drill and Theory.** Continuation of Military Science 267. II; 3. Prerequisite: Military Science 267. GRICE, MATTHEWS.

275. **Transportation Corps Junior Drill and Theory.** Advanced transportation instruction to include organization of the transportation staff sections, organization and operation of railroads, military railway service, movements, port and stevedore operations, harbor craft and marine maintenance, highway transport service organization, and individual weapons and marksmanship. I; 3. Prerequisite: Military Science 174, or equivalent approved by head of department and institution. ELGES, KAUFER.

276. **Transportation Corps Junior Drill and Theory.** Continuation of Military Science 275. II; 3. Prerequisite: Military Science 275. ELGES, KAUFER.

277. **Transportation Corps Senior Drill and Theory.** Continuation of Military Science 276 to include theater of operations problems of military railway service, highway transport operations, highway traffic regulations and control, and movements control; logistics, overseas supply, command and staff, combat intelligence responsibilities of a Transportation Corps officer, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 276. ELGES, KAUFER.

278. **Transportation Corps Senior Drill and Theory.** Continuation of Military Science 277. II; 3. Prerequisite: Military Science 277. ELGES, KAUFER.

285. **Army Security Agency Junior Drill and Theory.** Advanced instruction in army security to include leadership, drill and exercise of command, individual weapons and marksmanship, organization and functions of army security agency, radio intercept and direction finding, military crypto systems, communication security, elementary cryptanalysis. I; 3. Prerequisite: Military Science 184, or equivalent approved by head of department and institution. STOWBRIDGE.

286. **Army Security Agency Junior Drill and Theory.** Continuation of Military Science 285. II; 3. Prerequisite: Military Science 285. STOWBRIDGE.

287. **Army Security Agency Senior Drill and Theory.** Continuation of Military Science 286 to include command and staff, combat intelligence, elementary cryptanalysis, theory and application of traffic analysis, cryptomaterial distribution and accounting, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 286. STOWBRIDGE.

288. **Army Security Agency Senior Drill and Theory.** Continuation of Military Science 287. II; 3. Prerequisite: Military Science 287. STOWBRIDGE.

295. **Ordnance Corps Junior Drill and Theory.** Advanced instruction in ordnance to include functional organization of ordnance department; automotive, small arms, ammunition, artillery and fire control matériel; ammunition supply; individual weapons and marksmanship. I; 3. Prerequisite: Military Science 194, or equivalent approved by head of department and institution. Open to students enrolled in College of Engineering or those majoring in chemistry or physics. HOLLEY, RAMAY.

296. **Ordnance Corps Junior Drill and Theory.** Continuation of Military Science 295. II; 3. Prerequisite: Military Science 295. WHITESELL.

297. **Ordnance Corps Senior Drill and Theory.** Continuation of Military Science 296 to include maintenance and supply, command of staff, combat intelligence, matériel specialty, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 296. WHITESELL.

298. **Ordnance Corps Senior Drill and Theory.** Continuation of Military Science 297. II; 3. Prerequisite: Military Science 297. WHITESELL.

# MINING AND METALLURGICAL ENGINEERING

*Professors:* H. L. Walker (Head of Department), P. A. Beck, W. R. Chedsey, W. H. Voskuil.

*Associate Professors:* W. H. Bruckner, E. J. Eckel, A. C. Forsyth, B. G. Ricketts, C. A. Wert.

*Assistant Professors:* R. W. Bohl, G. B. Clark, V. D. Hildebrandt, J. W. Marx, R. G. Wuerker.

*Assistants:* Choh-Yi Ang, R. D. Caudle, T. E. Coleman, Jr., B. I. Davis, W. R. Hoskins, J. M. Silvertsen.

## MINING ENGINEERING

### Courses for Undergraduates

**151. Elements of Mining.** Theory and practice in explosives, drilling, blasting, tunneling, shaft sinking, prospecting (including geophysical), exploration and development. I; 4. Prerequisite: Sophomore standing. Clark.

**152. Fuels.** A study of solid, liquid, and gaseous fuels, and their uses, with laboratory work on the analysis of coal and coke. II; 3. Prerequisite: Chemistry 104, or equivalent. Chedsey, Wuerker.

### Courses for Advanced Undergraduates

**204. Mine Surveying.** Methods of underground surveying. II; 2. Prerequisite: Civil Engineering 115, or equivalent. Chedsey.

**205. Summer Mine Surveying.** Two weeks practice in underground surveying in an Illinois coal mine. S; 2. Prerequisite: Mining Engineering 204. Chedsey.

**230. Mining Principles.** General course for students in curricula other than mining engineering. Drilling and blasting; prospecting; mining methods; haulage; hoisting; ventilation; mine evaluation and administration. I or II; 3. Prerequisite: Junior standing. Clark.

**251. Mine Administration.** Mining law, wage agreements, compensation, safety, and welfare. I; 3. Prerequisite: Senior standing in mining engineering. Chedsey.

**253. Principles of Mining Methods.** Principles and modern practices of coal and metal mining methods and how they are affected by the physical character of ore and rock as related to geophysics and geochemistry. I; 4. Prerequisite: Mining Engineering 151; senior standing in mining engineering, or consent of instructor. Clark.

**255. Mineral Dressing.** Crushing, grinding, sampling, screening, classification, flotation; flow sheets. I; 3. Prerequisite: Junior standing in mining engineering. Chedsey, Wuerker.

**256. Mine Examination and Valuation.** Methods of examining, valuing, and reporting on mining properties. II; 2. Prerequisite: Mining Engineering 253. Chedsey.

**257. Haulage, Hoisting, and Pumping.** Haulage: mine cars, locomotives, track problems, conveyors, scrapers, machine design; hoisting: ropes, cages, and skips, hoisting engines; mine drainage and pumping. I; 4. Prerequisite: Electrical Engineering 208; Mechanical Engineering 201. Required in the mining engineering curriculum and for students majoring in mining engineering. Wuerker.

**258. Mining Design.** Students are assigned design projects such as design of a head frame, shop building, shaft station, trestle, etc. II; 3. Prerequisite: Senior standing in mining engineering. Clark.

**260. Coal Preparation.** Mechanical preparation of coal; float and sink testing; washability curves; laboratory control. II; 2. Prerequisite: Mining Engineering 255. Chedsey, Wuerker.

262. **Mine Ventilation.** Mine gases; ventilation of mines; mine fires and explosions. II; 3. Prerequisite: Senior standing in mining engineering. CLARK.

291. **Thesis.** I; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

292. **Thesis.** II; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

299. **Inspection Trip.** Senior inspection trip to visit mining operations. I; no credit. Prerequisite: Senior standing. STAFF.

### Courses for Advanced Undergraduates and Graduates

302. **World Mineral Economics.** The role of minerals in a productive economy, the interdependence of minerals in industrial society and the problems arising out of their unequal geographic distribution and divided political control. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. VOSKUIL.

351. **Geophysics of Mining.** Same as Geology 351. Principles of geophysics and their application to mining processes. I; 3 hours, or 1 unit. Prerequisite: Senior standing in engineering or geology, or consent of instructor. CHEDSEY.

396. **Seminar.** Review of mining literature; reports; technical writing. II; 1 hour, or ¼ unit. Prerequisite: Senior standing. CHEDSEY.

## METALLURGICAL ENGINEERING

### Course for Undergraduates

150. **Introduction to Metallurgy.** Minerals and mineral dressing, fuels, refractories, roasting, sintering, and other basic processes of metallurgy. I, II; 3. Prerequisite: Chemistry 105, or equivalent. HILDEBRANDT.

### Courses for Advanced Undergraduates

201. **Principles of Physical Metallurgy.** Constitutional diagrams; equilibrium and nonequilibrium conditions; properties of metals and alloys related to structure; elementary physics of metals. I, II; 3. Prerequisite: Junior standing. WALKER.

203. **Physical Metallurgy Laboratory.** Construction of simple binary constitution diagrams; use of the metallurgical microscope; study of the microstructure of simple binary alloys. Laboratory to accompany Metallurgical Engineering 201. I, II; 1. Prerequisite: Junior standing; registration in Metallurgical Engineering 201. FORSYTH.

205. **Metallurgy of Iron and Steel.** Production of pig iron, wrought iron, and steel; blast, Bessemer, open hearth, and electric furnaces; iron ores and slags. I or II; 3. Prerequisite: Chemistry 105; registration in Metallurgical Engineering 207. BOHL.

207. **Metallurgical Calculations.** Fundamental calculations relating to processes, heat balances, and the thermochemistry of metallurgical reactions. I or II; 2. Prerequisite: Chemistry 123, or equivalent; registration in Metallurgical Engineering 205. HILDEBRANDT.

208. **Ferrous Metallography.** Internal structure, constitution, treatment, and properties of iron, plain carbon steel, and cast iron. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; registration in Theoretical and Applied Mechanics 221 and 223. ECKEL.

210. **Ferrous Metallography Laboratory.** Metallographic preparation of ferrous metal specimens; use of metallurgical miscroscope; photomicrography; analysis and interpretation of structures developed by heat treatment and by mechanical working. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; registration in Metallurgical Engineering 208. HILDEBRANDT.

211. **Metallurgical Fuels and Furnaces.** Metallurgical fuels and sources of energy; combustion devices and heating elements; instrumentation for temperature and atmosphere control in furnaces; types of furnace construction and design. I; 2. Prerequisite: Junior standing in metallurgical engineering; registration in Metallurgical Engineering 207 is recommended.

213. **Metallurgical Fuels and Furnaces Laboratory.** Laboratory analysis of solid, liquid, and gaseous fuels; furnace atmospheres. I; 1. Prerequisite: Registration in Metallurgical Engineering 211.

214. **Electrometallurgy.** Electrochemical principles applied to metallurgical processes. Production metallurgy of aluminum and magnesium. I or II; 2. Prerequisite: Metallurgical Engineering 150; registration in Metallurgical Engineering 216. RICKETTS.

216. **Electrometallurgy Laboratory.** Laboratory practice demonstrating the principles of electroplating, electrorefining, and electrowinning. I or II; 1. Prerequisite: Registration in Metallurgical Engineering 214. RICKETTS.

218. **Physics of Metals.** Atomic arrangements in metals and alloys; elastic and plastic behavior of metals; internal friction; diffusion; modern concepts of metal physics. II; 3. Prerequisite: Metallurgical Engineering 201. WERT.

230. **Engineering Metallurgy.** For students in curricula other than metallurgical engineering. Principles of crystallization of metals; constitution diagrams necessary for full understanding of the heat treatment of steels; properties of metals and alloys (ferrous and nonferrous) as related to structure, treatment, and engineering applications. I, II; 3. Prerequisite: Chemistry 104, 105, or 106; junior standing. FORSYTH.

251. **Nonferrous Metallography.** Internal structure, constitution treatment, and properties of nonferrous metals and alloys. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; Theoretical and Applied Mechanics 221 and 223. ECKEL.

253. **Nonferrous Metallography Laboratory.** Preparation of metallographic specimens and development of microscopic structures; photomicrography, interpretation of structures developed in nonferrous alloys. I, II; 3. Prerequisite: Metallurgical Engineering 208; registration in Metallurgical Engineering 251. BOHL.

255. **Metallurgy of Nonferrous Metals.** Continuation of Metallurgical Engineering 214. Processes for the recovery of copper, gold, lead, nickel, silver, tin, and zinc. I; 3. Prerequisite: Metallurgical Engineering 214. RICKETTS.

256. **Metallurgy of Deep Drawing and Pressing.** The general and specific defects and difficulties encountered in the deep drawing and pressing of steel, brass, aluminum, magnesium, copper and copper base, nickel, and stainless steel sheet metal. I, II; 3. Prerequisite: Metallurgical Engineering 208, 210, 251, and 253. BOHL.

258. **Alloy Steels.** Low-alloy and high-yield strength constructional steels; elements acting as ferrite strengtheners; elements acting as carbide formers; intermediate alloy steels; effect of elements upon heat treatment and properties; correlation of properties with service requirements. I, II; 3. Prerequisite: Metallurgical Engineering 208 and 210. FORSYTH.

260. **Advanced Physical Metallurgy Laboratory.** Laboratory practice applying much of the material learned in previous courses. Most of the heat treating, metallographic, and special testing equipment in the department is used. I, II; 3. Prerequisite: Senior standing in metallurgical engineering. RICKETTS.

291. **Thesis.** I; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

292. **Thesis.** II; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

295. **Metallurgical Seminar.** Review of current metallurgical literature; classroom reports and discussion; preparation of technical abstracts and reports. I, II; 1. Prerequisite: Senior standing in metallurgical engineering. WALKER.

296. **Metallurgical Seminar.** Continuation of Metallurgical Engineering 295. I, II; 1. Prerequisite: Senior standing in metallurgical engineering. WALKER.

299. **Inspection Trip.** Senior inspection trip to visit metallurgical industries. I; no credit. Prerequisite: Senior standing. STAFF.

### Courses for Advanced Undergraduates and Graduates

301. **Metallurgy of Welding.** A survey is made of existing welding procedures and their metallurgical (ferrous and nonferrous) consequences with respect to the weld and base metal involved thermally in the welding operations. Heat flow in metals, arc behavior, slag behavior, and the physical metallurgy of heat-affected base metal are considered. Engineering phases of welding covered are economics of welding in relation to other methods of joining metals or producing engineering structures, thermal stresses, specification of materials for weld and base metal, and methods of production by means of welding and gas cutting. I or II; 3 hours, or ¾ or 1 unit. Prerequisite: Senior standing in metallurgical engineering; Metallurgical Engineering 208 and 210. BRUCKNER.

302. **Powder Metallurgy.** Production of powdered metals; fabrication of metal shapes from powdered metals; compacting, sintering, testing, and application of powdered metal shapes. II; 2 hours, or ¾ or 1 unit. Prerequisite: Approval of department; registration in Metallurgical Engineering 304; senior standing. ECKEL.

304. **Powder Metallurgy Laboratory.** Experiments involving the testing, briquetting, sintering, repressing of metal powders, and the testing of sintered compacts. II; 1 hour, or ¼ unit. Prerequisite: Approval of department; registration in Metallurgical Engineering 302; senior standing. ECKEL.

305. **Metallurgy of Steel Castings.** Technical and metallurgical control in the production of steel castings; acid and basic furnace practices; control of slag in steel making; heat treatment and metallography of steel castings. I, II; 3 hours, or ¾ or 1 unit. Prerequisite: Metallurgical Engineering 205, 208, and 210. FORSYTH.

308. **Metallurgical Kinetics and Thermodynamics.** Fundamental thermodynamic considerations and application of thermodynamics to metallurgical problems. II; 3 hours, or ¾ unit. Prerequisite: Senior standing; Chemistry 246. Offered in 1951-1952 and in alternate years. HILDEBRANDT.

309. **Mechanical Behavior of Metals.** The fundamental properties of metal crystals are studied with particular emphasis on electrical, thermal, and elastic properties; the fundamentals of crystal plasticity; slip, twinning, dislocations in single and polycrystals; the anelastic properties of metals, with emphasis on internal friction. I; 3 hours, or 1 unit. Prerequisite: Consent of instructor. Offered in alternate years.

310. **Kinetics of Phase Changes in Metals.** Diffusion in metals; the role of diffusion in processes important in metallurgy; nucleation and kinetics of phase changes in metals; examples of phase changes and their importance; the precipitation hardening systems. II; 3 hours, or 1 unit. Prerequisite: Consent of instructor. Offered in alternate years.

## MUSIC

*Professors:* J. M. KUYPERS (on leave of absence as Director of School of Music 1950-1951), D. A. BRANIGAN (Acting Director of School of Music), S. FLETCHER, B. R. FOOTE, A. A. HARDING (Emeritus), W. G. HILL, M. H. HINDSLEY, H. KESSLER, R. H. MILES, S. SCHOONMAKER, G. F. SCHWARTZ (Emeritus), P. YOUNG.

*Associate Professors:* DOROTHY E. BOWEN, B. M. GOODMAN, L. R. HAMP, K. KELLOGG, J. P. PAINTER, P. S. PETTINGA, B. PHILLIPS, L. A. POTTER, P. ROLLAND, W. L. ROOSA, H. C. SCHMITT, S. STRAVINSKY, R. H. SWENSON, EDITH USRY, G. R. WALLER, JANE C. WATT, E. WEIGEL, VELMA K. WILSON.

*Assistant Professors:* J. ALLEN, G. W. BINKERD, BETH BRADLEY, N. CAZDEN,

J. R. Kelly, E. D. Kisinger, W. Kuhn, W. H. Miller, Claire L. Richards, T. S. Richardson, H. O. Sexton, Miriam B. Stewart, L. E. Zirner.

*Associate:* Kathryn J. Sutherlin (on leave).

*Instructors:* J. K. Albertson, A. M. Carter, Dorothy E. Clark, Phyllis E. Edwards, J. C. Garvey, M. C. Howe, G. H. Hunter, Mary F. James, Colleen J. Kirk, D. A. Ledet, W. P. Malm (on leave), A. J. McDowell, P. W. Price, E. V. Putnik, T. Ribbink, L. A. Starr.

*Assistants:* A. Brown, Joanna S. Lange, Joanne G. Makris, K. McCarty, Mildred K. Shields, D. Tucker, R. Williams.

## Requirements for L.A.S. Students

**Major:** Thirty-two hours in music including the following: Music 102, 103, 106, 107, 226, and 227; two hours of Music 246; four hours of applied music (Music 160-177); six hours of electives in advanced music history. Students unable to pass the qualifying examination required for registration in Music 102 must take Music 100 in excess of graduation requirements.

The qualifying examination in piano given at the time of entrance presumes a moderate degree of proficiency (scales, simple compositions, and sight reading, together with an adequate keyboard technique). Students unable to meet this proficiency must satisfy this requirement in excess of curriculum requirements in applied music.

**Minor:** Twenty hours in one or two subjects chosen from the following list: history, languages, language and literature, philosophy, physics, physiology, psychology, sociology and anthropology. At least eight hours must be taken in each subject if two are chosen.

## Courses for Undergraduates

**100. Rudiments of Theory.** Notation, scales, intervals, chords, terminology. Required of all School of Music students who fail the placement examination in Theory of Music. Open to students from the other colleges of the University. I, II; 2. Bradley.

**102. Theory of Music.** Harmony, counterpoint, and ear training. A study of the basic principles involved in the art of musical composition, including fundamental relationship of tones, melodic and harmonic construction in two and three parts, using intervals and triads with inversions. Instruction is carried out by means of aural perception, dictation, sight-singing, work at the keyboard, improvisation, written assignments, historical examples, individual research problems, and the complete process of writing, preparing, and bringing to performance with voices and instruments specific individual and group projects in musical composition. I, II; 4. Prerequisite: Music 100, or equivalent. Binkerd, Carter, Hunter, Ledet, Malm, Price, Putnik, Ribbink.

**103. Theory of Music.** Harmony, counterpoint, and ear training. A study of the basic principles involved in the art of musical composition, including fundamental relationship of tones; melodic and harmonic construction in two and three parts, using intervals and triads with their inversions. Instruction is carried out by means of aural perception, dictation, sight-singing, work at the keyboard, improvisation, written assignments, historical examples, individual research problems, and the complete process of writing, preparing, and bringing to performance with voices and instruments specific individual and group projects in musical composition. I, II; 4. Prerequisite: Music 102, or equivalent. Binkerd, Carter, Hunter, Ledet, Malm, Ribbink, Weigel.

**106. Theory of Music.** Harmony, counterpoint, and ear training. Harmony and keyboard harmony. I, II; 4. Prerequisite: Music 103, or equivalent. Kelly, Potter, Price, Putnik, Weigel.

**107. Theory of Music.** Harmony, counterpoint, and ear training. Harmony and keyboard harmony. I, II; 4. Prerequisite: Music 106. Carter, Potter, Putnik, Weigel.

**110. Appreciation of Music.** Opera. Historical development of opera, emphasizing and analyzing stylistic, national trends, and musical and dramatic expression. I, II; 2. Prerequisite: Sophomore standing. Zirner.

114. **Appreciation of Music.** Symphonic poems and symphonies. I, II; 2. Prerequisite: Sophomore standing. ALBERTSON, KUYPERS.

117. **Appreciation of Music.** Symphonies, symphonic poems, and chamber music. II; 2. Prerequisite: Music 114, or consent of instructor. KUYPERS.

120. **Introduction to the History of Music.** A survey of the art of music among the other arts in the life of man. For music students only. I; 2. ROOSA.

121. **Introduction to the History of Music.** A survey of the art of music among the other arts and in the life of man. For music students only. II; 2. Prerequisite: Music 120. ROOSA.

122. **Introduction to Music Literature.** This course is designed primarily for the layman. Its main objectives are to train students in intelligent listening and to acquaint them with many great works of the literature of music. For non-music students only. I; 3. CAZDEN, KUYPERS.

123. **Introduction to Music Literature.** This course is designed primarily for the layman. Its main objectives are to train students in intelligent listening and to acquaint them with many great works of the literature of music. For non-music students only. II; 3. Prerequisite: Music 122. CAZDEN, KUYPERS.

130. **Recreational Music.** Community music agencies and facilities; recreational music programs and techniques. I, II; 2.

## Courses for Advanced Undergraduates

210. **Instrumentation.** Orchestration and arranging for orchestral groups. I, II; 2. Prerequisite: Senior standing in music. CARTER, HUNTER, PHILLIPS.

211. **Instrumentation.** Problems in arranging for all wind instruments. I, II; 2. Prerequisite: Senior standing in music, Music 210, or consent of instructor. CARTER, PHILLIPS.

212. **Music for Elementary Teachers.** A presentation of music for students preparing to teach in the elementary schools. Needed for state elementary school certificate, but not acceptable for credit in the School of Music. I; 3. V. WILSON.

213. **Music for Elementary Teachers.** A presentation of music for students preparing to teach in the elementary schools. Needed for state elementary school certificate, but not acceptable for credit in the School of Music. II; 3. Prerequisite: Music 212. V. WILSON.

214. **Elementary and Junior High School Music.** Technique and materials for teaching choral and theoretical music in the elementary and junior high school. I; 2. Prerequisite: Junior standing in music, or consent of instructor. V. WILSON.

215. **Senior High School Choral Music.** Techniques and materials for teaching choral music (choruses, a cappella choirs, small vocal ensembles, voice classes, operettas, and cantatas) in the senior high school. II; 2. Prerequisite: Music 214, or consent of instructor. KIRK.

217. **Instrumental School Music.** Methods dealing with the teaching of instruments and the organization of instrumental groups in the grade school and junior and senior high school. I, II; 2. Prerequisite: Music 215, or consent of instructor. KUHN.

220. **Conducting.** I, II; 2. Prerequisite: Junior standing in music. KIRK, KISINGER, KUHN.

221. **Conducting.** II; 2. Prerequisite: Junior standing in music. KISINGER.

224. **Appreciation of Music.** A course in music appreciation designed to meet the needs of music education majors. Operatic works, as well as smaller forms of compositions, are covered, and special emphasis is made on their place and use in typical classroom situations. I; 2. KIRK.

225. **Appreciation of Music.** A course in music appreciation designed to meet the needs of music education majors. Symphonic works, as well as smaller forms of compositions, are covered, and special emphasis is made on their place and use in typical classroom situations. II; 2. KIRK.

226. **History of Music.** General history of music to 1700; operas and oratorios to the present. For music students only. I; 2. CAZDEN, ROOSA.

227. **History of Music.** Instrumental music and solo song from 1700 to the present. For music students only. II; 2. Prerequisite: Music 226, or sophomore standing. CAZDEN, ROOSA.

228. **Proseminar.** A course providing special preparation for graduate study. I; 2. Prerequisite: Senior standing in music and/or consent of instructor. HILL and GRADUATE STAFF.

229. **Proseminar.** A course providing special preparation for graduate study. II; 2. Prerequisite: Senior standing in music and/or consent of instructor. HILL and GRADUATE STAFF.

234. **Musical Composition for Dance.** Fundamentals of music composition as related to the dance. Experience in composing musical settings with emphasis upon interval quality and tensional movement quality. I, II; 2. Prerequisite: Physical Education for Women 210 and/or consent of instructor. RIBBINK.

240. **Symphony II.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. HUNTER.

241. **University Orchestra.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. GOODMAN.

242. **Sinfonietta.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. GOODMAN.

243. **Teacher Training Orchestra.** This course provides an opportunity for music education majors to study, play, and conduct graded orchestra literature best suited to the educational needs of the public schools. I, II; ½. Prerequisite: Completion of Music 185, or consent of instructor.

246. **Collegium Musicum.** Singing and playing of early music. Western musical culture will be covered, proceeding from earliest available compositions up to, but not including, the familiar concert repertoire. In the effort to capture the spirit of each period, instruments used will be authentic to the periods insofar as practicable. Advanced students may be allowed a share in the research leading to performance of the works used. I, II; 1. Prerequisite: Consent of instructor. HUNTER.

250. **String Ensemble.** The student participates in various ensemble groups such as trios, quartets, quintets, etc., for the study of chamber music literature. The course may be repeated or taken during the freshman and sophomore year without credit. I, II; ½. Prerequisite: Junior standing, or consent of instructor. POTTER, WALLER, and STRING FACULTY.

252. **Woodwind Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. HOWE, JAMES, LEDET, MCDOWELL, PUTNIK.

254. **Brass Ensemble.** Ensembles of mixed brasses in small and large forms. I, II; ½. Prerequisite: Junior standing, or consent of instructor. SEXTON, STARR.

256. **Percussion Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. PRICE.

260. **Piano Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. SCHOONMAKER.

264. **Organ Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. PETTINGA.

266. **Applied Music Pedagogy.** Designed to provide the student in the Bachelor of Music curriculum with practical experience in the teaching of piano, voice, or string instruments and to acquaint him with carefully selected materials appropriate for pupils at various levels of advancement. Problems of technic and style will be dealt with through lectures, discussions, demonstrations, practice teaching, and studio visitations. I, II; 1. BOWEN, BRADLEY, FLETCHER, ROLLAND.

271. **Oratorio Society.** Performance of oratorios and other major choral works in cooperation with the University Symphony Orchestra. An advanced mixed-voice chorus open to students, faculty, and townspeople. Course credit to juniors and seniors. I, II; ½. YOUNG.

272. **University Chorus.** Performance of cantatas and other choral works. A mixed-voice chorus for average and beginning singers. Open to students, faculty, and townspeople. Course credit to juniors and seniors. I, II; ½. ALLEN.

273. **Women's Glee Club.** Practical experience in the rehearsal and public performance of choral music of various periods and styles. Open to all women students. Course credit to juniors and seniors. I, II; ½. ALBERTSON.

274. **Men's Glee Club.** Practical experience in the rehearsal and public performance of choral music of various periods and styles. Open to all men students. Meets in two sections: one for advanced singers; the other for less proficient singers. Course credit to juniors and seniors. I, II; ½. YOUNG.

275. **University Choir.** Practical experience in mixed-voice singing of accompanied and unaccompanied music of various periods and styles. A highly advanced group for competent student singers. Course credit for juniors and seniors. I, II; ½. YOUNG.

279. **Opera Workshop and Ensemble.** Preparation and public performance of grand or light opera. Covers the music and acting only. Students desiring experience in costuming, stage management, scenery, publicity, etc., should apply to the Illini Theatre Guild, Lincoln Hall, which cooperates in the opera productions. Admission is by tryout test. I, II; ½. Prerequisite: Junior standing, or consent of instructor. ZIRNER.

## Courses for Advanced Undergraduates and Graduates

300. **Theory of Music.** Advanced harmony; altered chords; notation and harmonization of the chromatic scale; chromatic modulation; enharmonic transformations; use of inharmonic tones; harmonic analysis. I, II; 2 hours, or ¼ unit. Prerequisite: Music 107. BINKERD, PHILLIPS.

301. **Theory of Music.** Advanced harmony; altered chords; notation and harmonization of the chromatic scale; chromatic modulation; enharmonic transformations; use of inharmonic tones; harmonic analysis. I, II; 2 hours, or ¼ unit. Prerequisite: Music 300. BINKERD.

302. **Theory of Music.** Free counterpoint. Creative writing in linear counterpoint of the following: rounds, instrumental and vocal; canons; inventions; and fugues. Analysis of Bach inventions and well-tempered clavichord. I; 2 hours, or ½ unit. Prerequisite: Music 301. KELLY.

303. **Theory of Music.** Free counterpoint. Creative writing in linear counterpoint of the following: rounds, instrumental and vocal; canons; inventions; and fugues. Analysis of Bach inventions and well-tempered clavichord. II; 2 hours, or ½ unit. Prerequisite: Music 302. KELLY.

306. **Composition.** Work in original composition including the study of fugue, canon, and of the small and large homophonic forms. I, II; 3 or 5 hours, or ½ or 1 unit. Five hours credit given when course is taken as major subject involving the preparation of a recital program of original compositions. Prerequisite: Music 107, or consent of instructor. May be taken in successive semesters for up to thirty hours credit. KELLY, KESSLER, PHILLIPS, WEIGEL.

314. **Analysis of Musical Form.** An elementary, systematic survey of the principles and means employed in musical composition. I; 2 hours, or ¼ unit. Prerequisite: Music 107. HILL.

315. **Analysis of Musical Form.** Continuation of Music 314. II; 2 hours, or ¼ unit. Prerequisite: Music 314. HILL.

316. **Teaching of Theory and Harmony.** Techniques and materials used in the teaching of theory of music in senior high school and junior college. I; 2 hours, or ½ unit. Prerequisite: Music 300, or consent of instructor. CARTER.

317. **Guidance in Music.** Study of guidance programs and counseling procedures; survey of various types of musical careers and careers related to music; discussion of necessary training and qualifications for each type of career. I or II; 3 hours, or ½ unit. Prerequisite: Advanced undergraduate or graduate standing in music.

320. **Advanced History of Music.** I; 2 hours, or ¼ unit. Prerequisite: Music 226 and 227. HILL.

321. **Advanced History of Music.** II; 2 hours, or ¼ unit. Prerequisite: Music 320. HILL.

327. **Contemporary Music.** A survey of all important trends, forms, and styles of modern music from 1875 to the present. I, II; 2 hours, or ½ unit. Prerequisite: Junior standing and/or consent of instructor. CAZDEN, PHILLIPS.

330. **Instrumental Clinic.** Application of principles and techniques taught in previous music education courses. II; 2 hours, or ½ unit. Prerequisite: Music 217, 220, 221, or consent of instructor. STARR.

331. **Instrumental Clinic.** Application of principles and techniques taught in previous music education courses. II; 2 hours, or ½ unit. Prerequisite: Music 217, 220, 221, or consent of instructor. STARR.

332. **Percussion Methods.** Designed primarily for teachers of school music who may or may not be percussion performers, but who wish to teach percussion and initiate such a program in the schools. I or II; 3 hours, or ½ unit. Prerequisite: Senior or graduate standing in music education; Music 196 and 256, or equivalent. PRICE.

334. **Methods of String Class Teaching.** This course is designed primarily for teachers of school music who are not performers on a stringed instrument yet would like to be able to teach string classes and start an orchestral program in the schools. S; 2 hours, or ½ unit. Prerequisite: Senior or graduate standing in music education, or consent of instructor. WALLER.

338. **Music Bibliography and Reference.** Detailed study of the basic and most useful reference and bibliographic aids. Practice problems in the use of specific titles and in how to find materials in the library will be given. Music, books about music, and recordings of music are included in the course. I, II; 3 hours, or ½ unit. Prerequisite: For students in the School of Music, senior standing or consent of instructor; for non-music students, senior standing with at least one year each of music history and music theory at the college level, or equivalent. ALLEN.

## APPLIED MUSIC

### Courses for Undergraduates

160. **Piano.** Private lessons in piano on the undergraduate level. I, II; 2 or 4. S; 1 or 2. BRADLEY, EDWARDS, FLETCHER, LANGE, MAKRIS, RICHARDS, SCHOONMAKER, STRAVINSKY, USRY, WATT, ZIRNER.

161. **Voice.** Private lessons in singing on the undergraduate level. I, II; 2 or 3. S; 1 or 2. BOWEN, CLARK, FOOTE, HAMP, KELLOGG, MILLER, STEWART.

162. **Organ.** Fundamental courses in organ technic and registration, culminating in performances of the easier works of Bach, Mendelssohn, Franck, and Rheinberger. I, II; 2 or 4. S; 1 or 2. MILES, PETTINGA, SHIELDS.

163. **Violin.** Private instruction in violin on the undergraduate level. I, II; 2 or 4. S; 1 or 2. GOODMAN, ROLLAND, SCHMITT.

164. **Viola.** Private instruction in viola on the undergraduate level. I, II; 2 or 4. S; 1 or 2. GARVEY.

165. **Cello.** Private instruction in cello on the undergraduate level. I, II; 2 or 4. S; 1 or 2. POTTER, SWENSON.

166. **String Bass.** Tuning by harmonics. Development of flexibility in bowing and a practical working knowledge of the first six positions. Major and minor scales, within

two octaves, as well as arpeggios. String ensemble and orchestra studies and solo repertoire and studies. Study of bowing styles. I, II; 2 or 4. S; 1 or 2. EDWARDS.

167. **Flute.** Private lessons in flute on the undergraduate level. I, II; 2 or 4. S; 1 or 2. JAMES, PUTNIK.

168. **Clarinet.** Private lessons in clarinet on the undergraduate level. I, II; 2 or 4. S; 1 or 2. MCCARTY, MCDOWELL.

169. **Oboe.** Private lessons in oboe on the undergraduate level. I, II; 2 or 4. S; 1 or 2. LEDET.

170. **Bassoon.** Private lessons in bassoon on the undergraduate level. I, II; 2 or 4. S; 1 or 2. JAMES.

171. **Cornet and Trumpet.** Private instruction in cornet and trumpet at the undergraduate level. I, II; 2 or 4. S; 1 or 2. SEXTON.

172. **French Horn.** Private instruction in French horn on the undergraduate level. I, II; 2 or 4. S; 1 or 2. HOWE.

173. **Trombone.** Private instruction in trombone on the undergraduate level. I, II; 2 or 4. S; 1 or 2. STARR.

174. **Baritone.** Private instruction in baritone on the undergraduate level. I, II; 2 or 4. S; 1 or 2. STARR.

175. **Tuba.** Private instruction in tuba on the undergraduate level. I, II; 2 or 4. S; 1 or 2. STARR.

176. **Percussion.** Private instruction in percussion on the undergraduate level. I, II; 2 or 4. S; 1 or 2. PRICE.

177. **Harp.** Private instruction in harp on the undergraduate level. I, II; 2 or 4. S; 1 or 2. MAKRIS.

180. **English Diction.** Phonetics applied to English song literature. Lectures, class discussions, and individual clinical analysis and practice. I; 1. BOWEN.

181. **Italian Diction.** Phonetics applied to Italian song literature. Lectures, class discussions, and individual clinical analysis and practice. II; 1. Prerequisite: Music 180, or consent of instructor. BOWEN.

182. **German Diction.** I; 1. Prerequisite: Music 180 and 181. KELLOGG.

183. **German Diction.** II; 1. Prerequisite: Music 182, or consent of instructor. KELLOGG.

184. **String Instruments.** Violin, viola, cello, and bass. Class instruction in the fundamentals of playing violin, viola, violoncello, and string bass. I, II; 2. Prerequisite: Junior standing in music, or consent of instructor. BROWN, WALLER, WILLIAMS.

185. **String Instruments.** Violin, viola, cello, and bass. Class instruction in the fundamentals of playing violin, viola, violoncello, and string bass. I, II; 2. Prerequisite: Junior standing in music, or consent of instructor. BROWN, WALLER, WILLIAMS.

190. **Clarinet.** I, II; 2. KISINGER, MCCARTY.

192. **Cornet (or Trumpet).** I, II; 2. HOWE, TUCKER.

194. **Flute and Trombone.** I, II; 2. Prerequisite: Music 190 and 192. JAMES, PUTNIK, STARR, TUCKER.

196. **French Horn and Percussion.** I, II; 2. Prerequisite: Music 192. HOWE, PRICE.

198. **Oboe and Bassoon.** I, II; 2. Prerequisite: Music 190. JAMES, LEDET.

## Courses for Advanced Undergraduates and Graduates

360. **Piano.** Private lessons in piano on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 160; qualifying examination for transfer students. BRADLEY, EDWARDS, FLETCHER, RICHARDS, SCHOONMAKER, STRAVINSKY, USRY, WATT, ZIRNER.

**361. Voice.** Private lessons in singing on the advanced undergraduate and graduate level. I, II; 2 or 3 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 161; qualifying examination for transfer students. BOWEN, CLARK, FOOTE, HAMP, KELLOGG, MILLER, STEWART.

**362. Organ.** A repertoire course, using graded material, culminating in performance of the masterpieces of Bach, Franck, and Rheinberger; and selected works from the pre-Bach and contemporary periods. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 162; qualifying examination for transfer students. MILES, PETTINGA.

**363. Violin.** Private instruction in violin on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 163; qualifying examination for transfer students. GOODMAN, ROLLAND, SCHMITT.

**364. Viola.** Private instruction in viola on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit; S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 164; qualifying examination for transfer students. GARVEY.

**365. Cello.** Private instruction in cello on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 165; qualifying examination for transfer students. POTTER, SWENSON.

**366. String Bass.** Tuning by harmonics. Development of flexibility in bowing and a practical working knowledge of the first six positions, also thumb positions. Major and minor scales through higher positions. String ensemble and orchestra studies; solo repertoire and studies. Study of various bowing styles. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 166; qualifying examination for transfer students. EDWARDS.

**367. Flute.** Private lessons in flute on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 167; qualifying examination for transfer students. JAMES, PUTNIK.

**368. Clarinet.** Private lessons in clarinet on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 168; qualifying examination for transfer students. MCDOWELL.

**369. Oboe.** Private lessons in oboe on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 169; qualifying examination for transfer students. LEDET.

**370. Bassoon.** Private lessons in bassoon on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 170; qualifying examination for transfer students. JAMES.

**371. Cornet and Trumpet.** Private instruction in cornet and trumpet on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 171; qualifying examination for transfer students. SEXTON.

**372. French Horn.** Private instruction in French horn on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 172; qualifying examination for transfer students. HOWE.

**373. Trombone.** Private instruction in trombone on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 173; qualifying examination for transfer students. STARR.

**374. Baritone.** Private instruction in baritone on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 174; qualifying examination for transfer students. STARR.

**375. Tuba.** Private instruction in tuba on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 175; qualifying examination for transfer students. STARR.

376. **Percussion.** Private instruction in percussion on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 176; qualifying examination for transfer students. PRICE.

377. **Harp.** Private lessons in harp. I, II; 2 or 4 hours, or ¼ to 1 unit. S; 1 to 2 hours, or ¼ unit. Prerequisite: Music 177; qualifying examination for transfer students. MAKRIS.

380. **French Diction.** Principles of French pronunciation applied to French vocal literature. Class and individual clinical analysis and practice. I; 1 hour, or ¼ unit. Prerequisite: Music 163; junior standing. BOWEN.

381. **French Diction.** Principles of French pronunciation applied to French vocal literature. Class and individual clinical analysis and practice. II; 1 hour, or ¼ unit. Prerequisite: Music 380; junior standing, or consent of instructor. BOWEN.

382. **Senior Diction.** Preparation for senior recital; review of English, French, Italian, and German diction; stage deportment. I; 1 hour, or ¼ unit. Prerequisite: Music 381; senior standing. BOWEN.

383. **Senior Diction.** Preparation for senior recital; review of English, French, Italian, and German diction; stage deportment. II; 1 hour, or ¼ unit. Prerequisite: Music 382; senior standing, or consent of instructor. BOWEN.

## NAVAL SCIENCE

*Professor:* Captain O. H. DODSON (Head of Department).

*Assistant Professors:* Captain G. M. GOLLEHER; Lieutenants A. T. FORD, C. E. LITTLE, M. S. SNOWDEN.

*Assistants:* G. L. HARTER, T. HARWARD, J. A. MAJCHROWICZ, W. J. PETERSEN, W. O. WEATHERS.

### Courses for Undergraduates

100. **Naval Science Laboratory.** A non-credit course designed to give the N.R.O.T.C. student, through practical demonstration, a better grasp of Naval Science subjects taught in the classrooms and a working knowledge of infantry drill. I, II; no credit. FORD, GOLLEHER, LITTLE, SNOWDEN.

111. **Naval History and Orientation.** An analysis of factors contributing to sea power and its bearing on modern naval strategy and tactics. I; 3. Prerequisite: Registration in Naval Science 100. DODSON, SNOWDEN.

112. **Naval History and Orientation.** An introduction to life and customs of the Navy. II; 3. Prerequisite: Registration in Naval Science 100. SNOWDEN.

121. **Naval Weapons.** Designed to give the student a basic understanding of the mechanisms of naval guns and the problem of fire control. I; 3. Prerequisite: Naval Science 111 and 112 desirable but not required for Naval Science students; registration in Naval Science 100. LITTLE.

122. **Naval Weapons.** Continuation of Naval Science 121. Deals with the fire control problem and the fundamentals of electronic equipment carried on board naval vessels. II; 3. Prerequisite: Naval Science 121; registration in Naval Science 100. LITTLE.

### Courses for Advanced Undergraduates

231. **Navigation.** Designed to give the student an understanding of the theory and technique of navigation and basic tactics. I; 3. Prerequisite: Registration in Naval Science 100. FORD.

232. **Navigation.** Designed to further the student's knowledge of celestial and geographical navigation for ships and aircraft, and to give basic knowledge in handling formations of ships for cruising and battle conditions. II; 3. Prerequisite: Naval Science 231; registration in Naval Science 100. FORD.

241. **Naval Machinery and Diesel Engines.** To familiarize the student with naval marine engineering installations and auxiliary machinery. I; 3. Prerequisite: Registration in Naval Science 100.

242. **Ship Stability, Naval Justice and Leadership.** To familiarize the student with the principles of ship stability and buoyancy in the practices of damage control, acquaint him with the procedures for and the responsibility of an officer in the administration of naval justice and to aid him in understanding the psychology of leadership. II; 3. Prerequisite: Naval Science 241 desirable but not required for Naval Science students; registration in Naval Science 100. DODSON, GOLLEHER.

291. **History of the Art of War.** To equip the student with a background of fundamental knowledge which will encompass (1) origin, development, and role of U. S. military forces; (2) significance of military power; (3) the classic principles of war, which when analyzed historically will provide further understanding of military operations. II; 3. Prerequisite: Naval Science 111, 112, 121, 122, and 231 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

292. **American Military History and Policy.** Analyzes chronologically selected battles in American history, with a view to broadening the student's knowledge of the principles of war, type of operations, and the development of weapons, tactics, and techniques. I; 3. Prerequisite: Naval Science 291 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

293. **Amphibious Warfare.** Provides the student with a broad introduction to the specialized field of amphibious warfare. II; 3. Prerequisite: Naval Science 291 and 292 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

## OCCUPATIONAL THERAPY

*Associate Professor:* BEATRICE D. WADE (Director of Curriculum).

### Course for Undergraduates

100. **Occupational Therapy Orientation.** History and development of professional aspects of occupational therapy; its scope and relation to applied professions, and its function in the field of physical and mental adjustment. I, II; 2. Prerequisite: Registration in occupational therapy curriculum. WADE.

## PHILOSOPHY

*Professors:* M. T. MCCLURE (Head of Department), M. H. FISCH, D. W. GOTSCHALK.

*Associate Professors:* B. MATES (Visiting), J. A. NICHOLSON, A. R. TURQUETTE, F. L. WILL.

*Assistant Professors:* B. J. DIGGS, O. A. KUBITZ.

*Instructors:* T. HAYNES, L. LINSKY, N. MARTIN, R. W. PELTZ, H. M. TIEBOUT.

*Assistants:* G. O. BROWN, R. A. CORNETT, W. J. EMBLOM, NANCY N. SKEEN, G. H. VROOMAN, D. H. WHITTIER, R. P. WIEBE.

### Requirements for L.A.S. Students

**Major:** Twenty hours from any courses offered by the department, including Philosophy 102, 303, 306, and 321, and excluding Philosophy 101 and 105.

**Minors:** Twenty hours selected from one or two of the following subjects (excluding Rhetoric 100, 101, 102, and first-year modern foreign language courses): astronomy, botany, chemistry, economics, education, English, French, geography, geology, German, Greek, history, Italian, Latin, mathematics, physics, political science, Portuguese, psychology, sociology and anthropology, Spanish, and zoology. If two subjects are chosen, at least eight hours must be taken in each subject, and the subjects and courses must be approved by the philosophy department. The curriculum on international affairs and the medieval studies program will be accepted as minors.

## Courses for Undergraduates

**101. Introduction to Philosophy.** I, II; 3. Prerequisite: Sophomore standing. STAFF.

**102. Logic.** Reasoning, detection of fallacies, evidence. I, II; 3. Prerequisite: Sophomore standing. STAFF.

**103. Ethics and Social Policy.** An examination of the moral aspects of social problems and a survey of ethical principles formulated to validate social policy. Not open to students with credit in Philosophy 105. I; 4. Prerequisite: Sophomore standing. DIGGS.

**104. Philosophy of Democracy.** An examination of the philosophical bases of democracy and some of its opponents. II; 4. Prerequisite: Sophomore standing. HAYNES.

**105. Moral Ideas and Practice.** Not open to students with credit in Philosophy 103. I, II; 2. Prerequisite: Sophomore standing. KUBITZ.

## Course for Advanced Undergraduates

**200. Honors Course.** I, II; 2. Prerequisite: Senior standing. STAFF.

## Courses for Advanced Undergraduates and Graduates

**303. History of Greek and Roman Philosophy.** I; 4 hours, or ½ to 1 unit. Prerequisite: Junior standing, or consent of instructor. MCCLURE.

**304. History of Medieval Philosophy.** Lectures and readings in the history of philosophy from St. Augustine to William of Ockham. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101 or 303, or consent of instructor. DIGGS.

**306. History of Modern Philosophy.** II; 4 hours, or ½ to 1 unit. MCCLURE.

**309. The Philosophy of Plato.** I; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101 or 303. NICHOLSON.

**311. Philosophic Ideas of the Nineteenth and Twentieth Centuries.** I, II; 3 hours, or ½ to 1 unit. FISCH.

**313. American Philosophy.** The history of philosophy in America from colonial times to the present. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

**316. Three Philosophical Poems.** Lucretius, *Of the Nature of Things;* Dante, *Divine Comedy;* Goethe, *Faust;* studied as literary expressions of three major movements in European thought: Greek naturalism, medieval supernaturalism, and modern romanticism. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101, or consent of instructor. Offered in 1951-1952 and in alternate years. FISCH.

**317. Great Books in Modern Thought.** Hume, Darwin, Marx, Freud. Reading and discussion of selected books which either have produced or themselves reflect in some important way a changed conception of man and the world. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. WILL.

**321. Ethics and Value Theory.** I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

323. **Philosophy of Art.** A discussion of the main philosophical principles of art and of outstanding contemporary philosophies of art. I; 3 hours, or ½ to 1 unit. GOTSHALK.

324. **Philosophy of Religion.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. NICHOLSON.

326. **Metaphysics.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. TIEBOUT.

328. **Philosophy of Science.** A study of some philosophical problems that have developed from modern science. II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. TURQUETTE.

330. **Theory of Knowledge.** The relative acceptability of authority, intuition, and the method of hypothesis as ways of establishing belief; logical and empirical truth; pragmatism and positivism; other selected contemporary topics. II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. WILL.

333. **Symbolic Logic.** A study of the elementary principles of symbolic analysis as applied to logical problems. I; 3 hours, or ½ to unit. TURQUETTE.

334. **Symbolic Logic.** A general study of the more refined methods of symbolic analysis as applied to logical problems. Particular attention is devoted to proof procedures as they relate to the question of consistency and completeness. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 333, or consent of instructor. Offered in 1951-1952 and in alternate years. TURQUETTE.

336. **Philosophy of Law and of the State.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

337. **Semantics.** An investigation of semantical concepts such as denoting and truth; a study of the functions of language, definition, meaning and verification, semantical paradoxes. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. LINSKY.

350. **Philosophy and Contemporary Life.** A study of the relation between philosophy and contemporary life, including an analysis and discussion of the philosophical principles involved in the artistic, intellectual, cultural, and social developments of the modern world. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One course in Philosophy. GOTSHALK.

# PHYSICAL EDUCATION

Faculty from Departments of Physical Education for Men and Physical Education for Women

## DANCE

### Courses for Undergraduates

160. **Beginning Contemporary Dance.** I, II; 1. ERLANGER, FREEMAN, TURNER.

162. **Advanced Contemporary Dance.** I, II; 1. Prerequisite: Physical Education for Women 106, or consent of instructor. FREEMAN.

163. **Analysis of Rhythmic Movement.** An analysis of the inherent factors of rhythm. Application of rhythmic analysis to teaching of all activity. II; 2. Prerequisite: Dance 160. ERLANGER.

### Courses for Advanced Undergraduates

235. **Square and Ballroom Dance.** Designed for men and women students majoring in physical education, recreation, and dance. Methods of teaching and directing ballroom and American square dances in school and community groups with emphasis on organization and leadership. I; 2. Prerequisite: Junior standing. TURNER.

236. **Folk Dance.** Designed for men and women students majoring in physical education, recreation, and dance. Typical English and European folk dances with emphasis upon the teaching and directing of school and community groups. I or II; 1. Prerequisite: Junior standing, or consent of instructor. FREEMAN.

240. **Cultural Survey of Dance.** For students specializing in dance. I or II; 2. Prerequisite: Senior standing, or consent of instructor. ERLANGER.

241. **Percussion.** Techniques in use of percussion instruments; experience in accompanying; instruction in composition and orchestration with percussion instruments. I or II; 2. Prerequisite: Dance 162, or consent of instructor. FREEMAN, TURNER.

242. **Dance Composition.** Theory and laboratory problems in principles of composition. Individual and group creative work in dance forms and approaches to composition. I; 2. Prerequisite: Dance 162 and 163, or consent of instructor. TURNER.

243. **Creative Rhythms for Children.** Theories and techniques of approach to the teaching of rhythms (pre-school through eighth grade). Supervised practical experience with children in this age range. I or II; 2. ERLANGER.

244. **Teaching of Dance.** Theory and practice in curriculum construction, lesson planning and teaching, dance accompaniment, and presentation of recital programs. II; 3. Prerequisite: Dance 160 and 162, or consent of instructor. ERLANGER.

245. **Dance Production Workshop.** Principles and methods involved in production. Practical experience in the development and presentation of dance programs. I or II; 3. Prerequisite: Senior standing, or consent of instructor. FREEMAN, TURNER.

246. **Theory and Philosophy of Dance.** The place of dance in everyday life and in the cultural pattern. I or II; 3. ERLANGER.

## HEALTH EDUCATION

### Courses for Advanced Undergraduates

280. **Safety Education.** Safety in the home, on the farm, in industry, in recreation; traffic and fire safety. I, II; 2. FLORIO, SIBONS.

281. **First Aid.** Red Cross standard course in first aid. I, II; 2. HUBBARD, JACKSON, MATHEWS, NIELSEN, SCHNAUBER.

282. **Organization of School Health Programs.** School program in health service, healthful school living, health education, and community health service. I or II; 3. HOYMAN, LAWSON.

283. **Physical and Health Inspection.** Methods and materials of determining deviations from normal. I, II; 2. BOYS.

284. **Driver Education.** Cause and extent of highway accidents; highway laws and regulations; methods of teaching driving; and psychophysical testing. Students meet in class two hours a week and in small groups in dual control car one hour a week. I, II; 2. FLORIO.

287. **Field Work in Community Health.** Visitation, observation, and study of local community health programs. I, II; 2.

288. **Principles of Health Education.** History, scope, needs, and principles underlying the school health program. I, II; 3. HOYMAN, JACKSON, LAWSON.

## RECREATION

### Courses for Undergraduates

170. **Outdoor Recreational Sports.** Soccer, touch football, volleyball, softball, speedball. I, II; 2. BREEN, MATHEWS.

171. **Indoor Recreational Sports.** Badminton, handball, paddle tennis, squash racquets, table tennis, weight lifting. I, II; 2. BREEN, MATHEWS.

174. **Camp Counseling.** Objectives, administration, techniques, activity programs, evaluation. I, II; 3. GARRET, KENNEY, SIBONS, WAGNER.

176. **Principles of Recreation.** History of leisure and recreation; concepts of play and recreation; major recreation agencies. I, II; 3. POND, ROBERTSON, SAPORA.

### Courses for Advanced Undergraduates

270. **Social Recreation Activities.** Purpose, techniques of leadership, and practice in social play activities. I, II; 2. ROBERTSON.

271. **Organization of Sports Programs.** Organization of varsity, intramural, and recreational sports programs. I, II; 3. SEIDLER, WAGNER.

272. **Organization of Aquatic Programs.** History of aquatics; leadership training methods; swimming pool sanitation; pool and beach operational records. I, II; 2. BULLOCK, POHNDORF.

275. **Organization of Recreation Programs.** Public and private agency programs; leadership; activities; facilities. I, II; 3. ROBERTSON, SAPORA.

278. **Recreation Field Work.** Directed experience in public and private recreation programs. Students meet in class one hour each week and work with an assigned program six hours each week. I; 3. Prerequisite; Senior standing. ROBERTSON, SAPORA.

279. **Recreation Field Work.** Directed experience in public and private recreation programs. Students meet in class one hour each week and work with an assigned program six hours each week. II; 3. Prerequisite: Senior standing. ROBERTSON, SAPORA.

## PHYSICAL EDUCATION FOR MEN

*Professors:* S. C. STALEY (Head of Department), T. K. CURETON, H. S. HOYMAN, C. O. JACKSON, D. R. MILLS, G. T. STAFFORD.

*Associate Professors:* F. E. BOYS, R. ELIOT, B. A. INGWERSEN, H. E. KENNEY, W. H. ROETTGER.

*Assistant Professors:* H. A. COMBES, R. E. FLETCHER, A. E. FLORIO, A. W. HUBBARD, L. T. JOHNSON, R. H. JOHNSON, B. R. PATTERSON, H. C. PATERSON, A. V. SAPORA, R. E. SHELTON.

*Associates:* H. I. GILL (Emeritus), E. J. MANLEY.

*Instructors:* J. A. BENDER, H. J. BRAUN, M. H. EYLER, R. V. GANSLEN, M. R. GARRET, W. J. HUFFMAN, R. B. KING, A. B. KLINGEL, T. F. KRIZAN, D. E. LATHAM, D. K. MATHEWS, E. D. MICHAEL, R. I. MILLER, T. J. NUGENT, R. H. POHNDORF, C. P. POND, R. ROCHELLE, R. JAYANTI, A. H. SEIDLER.

*Assistants:* L. AGASE, W. J. BARBER, B. L. BECK, E. M. BERNAUER, T. BOCKMAN, JR., J. L. BREEN, M. C. BREWER, C. D. FULTON, G. E. HARVISON, P. HOLLAND, JR., R. E. HOPKINS, G. S. KAPAS, E. E. KEHE, M. H. KONG, E. C. LUNDIEN, R. E. MCADAM, R. E. MEARS, A. C. MOORE, P. K. NAKAMURA, R. P. OLSON, C. G. PURVIS, E. R. REUTER, C. ROBINSON, G. D. SIBONS, M. T. SMERDEL, R. T. STUDER, S. SUCIC, C. W. THOMAS, J. L. TILLEY, J. V. TOOHEY, W. D. VAN HUSS, M. A. VINCITORE, P. P. VOISARD, W. D. WILKINSON, M. WOLFSON, D. C. WOODWARD, W. T. WRIGHT, M. YUHASZ.

### Service Courses for Undergraduates

101. **Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. SHELTON and others.

102. **Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. SHELTON and others.

103. **Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. SHELTON and others.

104. **Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. SHELTON and others.

106. **Developmental Activities.** Activities that contribute to the development and maintenance of physical fitness. I, II; 1. BARBER and others.

108. **Beginning Swimming.** Skills, knowledge, attitudes, and conditions. I, II; 1. Open only to non-swimmers. MANLEY and others.

109. **Advanced Swimming.** Skills, knowledge, attitudes, and conditions. I, II; 1. Prerequisite: Ability to swim 100 yards. PATERSON and others.

110. **Life Saving.** Skills, knowledge, attitudes, and conditions. I, II; 1. Prerequisite: Ability to swim three strokes for 100 yards each. PATERSON and others.

112. **Individual Tumbling Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. Moore and others.

113. **Double Tumbling Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE.

114. **Apparatus Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE and others.

115. **Circus Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. POND.

117. **Boxing.** Skills, knowledge, attitudes, and conditions. I, II; 1. BREWER and others.

118. **Wrestling.** Skills, knowledge, attitudes, and conditions. I, II; 1. REUTER and others.

119. **Foil Fencing.** Skills, knowledge, attitudes, and conditions. I, II; 1. GARRET.

120. **Personal Defense Activities.** Skills, knowledge, attitudes, and conditions. I, II; 1. SEIDLER and others.

122. **Individual Athletics.** Skills, knowledge, attitudes, and conditions. I, II; 1. BERNAUER.

123. **Weight Lifting.** Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE and others.

124. **Track and Field Athletics.** Skills, knowledge, attitudes, and conditions. I, II; 1. R. I. MILLER and others.

125. **Flicker Ball and Beginning Ice Skating.** Skills, knowledge, attitudes, and conditions. I, II; 1. SEIDLER and others.

127. **Softball and Advanced Ice Skating.** Skills, knowledge, attitudes, and conditions. I, II; 1. BARBER and others.

128. **Soccer.** Skills, knowledge, attitudes, and conditions. I, II; 1. PURVIS and others.

129. **Volleyball.** Skills, knowledge, attitudes, and conditions. I, II; 1. BREEN and others.

132. **Archery.** Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE and others.

133. **Squash Racquets.** Skills, knowledge, attitudes, and conditions. I, II; 1. BRAUN and others.

134. **Handball.** Skills, knowledge, attitudes, and conditons. I, II; 1. SMERDEL and others.

135. **Tennis.** Skills, knowledge, attitudes, and conditions. I, II; 1. BRAUN and others.

136. **Badminton.** Skills, knowledge, attitudes, and conditions. I, II; 1. THOMAS and others.

137. **Bowling and Bait or Fly Casting.** Skills, knowledge, attitudes, and conditions. I, II; 1. KRIZAN.

139. **Backyard Sports.** Sports and related activities requiring only limited facilities and equipment. I, II; 1. FULTON.

142. **Ballroom Dance.** Same as Physical Education for Women 142. Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE.

143. **American Square Dance.** Same as Physical Education for Women 143. Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE.

## Professional Courses for Undergraduates

150. **Professional Orientation.** Introduction to the fields of physical education, health, safety, recreation, dance. I, II; 2. FLORIO, JOHNSON, KENNEY, LATHAM, SAPORA.

151. **Beginning Basketball.** Introductory skills, rules, and strategy. I, II; 2. BRAUN, FLETCHER, ROETTGER.

152. **Beginning Football.** Introductory skills, rules, and strategy. I, II; 2. FLETCHER, INGWERSEN, KING.

153. **Physical Conditioning Programs.** Physical fitness tests; calisthenics, medicine ball, bulldozer, grass, all-out and locomotor exercise; leadership technics. To be taken with Physical Education for Men 154. I, II; 2. POHNDORF, SEIDLER.

154. **Swimming.** Crawl, back, breast, and side strokes; diving; life saving. To be taken with Physical Education for Men 153. I, II; 2. S; 1. KLINGEL, PATERSON.

155. **Gymnastics.** Tumbling and apparatus stunts. I, II; 2. MOORE, POND.

156. **Track and Field.** Track events and field events; rules. I, II; 2. L. T. JOHNSON.

166. **Games for Children.** Same as Physical Education for Women 166. Games for classroom, playground, and gymnasium. Programs, lesson planning, and source materials. I, II; 2. DROM.

## Professional Courses for Advanced Undergraduates

204. **Organization of Physical Education.** Organization of the high school program in physical education. I, II; 3. JACKSON, R. H. JOHNSON.

205. **Tests and Measurements in Health, Physical Education, and Recreation.** Body type, organic, body mechanics, motor fitness, physical ability, and knowledge tests. I, II; 3. BENDER, HUBBARD.

206. **Kinesiology.** Mechanics and muscular action of balance and movement of the human body. I, II; 3. Prerequisite: Physiology 104 and 105. GANSLEN.

207. **Training Techniques.** Diagnostic procedures, massage, taping, bandaging, hydrotherapy, electrotherapy, handling emergency conditions, training quarters, facilities, and hygiene. I, II; 2. SHELTON.

208. **Theory of Prescribing Exercise.** Prescription and conduct of recreational and exercise programs for selected physical handicaps. I, II; 3. Prerequisite: Physiology 104 and 105. SHELTON.

209. **History of Sport and Physical Education.** Development of sport and physical education in Europe and the United States since 1750. I, II; 2. EYLER.

210. **Inspection Trip.** Visitation and inspection of physical education, health, safety, and recreation programs in public and private institutions. II; no credit. JACKSON.

213. **Advanced Football.** Offensive and defensive strategy; training drills. II; 2. S; 1. Prerequisite: Physical Education for Men 152. ELIOT.

214. **Advanced Basketball.** Offensive and defensive strategy; training drills. II; 2. S; 1. Prerequisite. Physical Education for Men 151. COMBES.

215. **Baseball.** Skills, rules, and strategy. I; 2. ROETTGER.

216. **Wrestling, Boxing, Fencing.** Skills, rules, and strategy. I; 2. PATTERSON.

217. **Theory of Coaching.** Basketball, football, and baseball schedule making; team management, scouting, and officiating. I; 3. S; 2. MILLS.

**220. Physical Education for the Classroom Teacher.** Same as Physical Education for Women 220. Methods and materials in physical education applicable to all grade levels. I, II; 2. DROM.

**221. Supervision of Physical Education in Elementary Schools.** Same as Physical Education for Women 221. Purposes, methods, and materials. I, II; 2. DROM.

## PHYSICAL EDUCATION FOR WOMEN

*Professor:* LOUISE FREER (Emerita).

*Associate Professor:* LAURA J. HUELSTER (Head of Department).

*Assistant Professors:* MARGARET ERLANGER, M. FLORENCE LAWSON, CARITA ROBERTSON, ENID SCHNAUBER.

*Instructors:* JO ANNE BOOKER, BEULAH DROM, NANCY E. HOUSTON, DORIS J. BULLOCK, MARGERY J. TURNER, HELEN WAGNER.

*Assistants:* VIRGINIA FREEMAN, MARY DENT GRAY, LILLIAN HITE, MARJORIE L. MILES, FRANCES M. MILLER, LORRAINE M. NIELSEN.

### Service Courses for Undergraduates

**100. Fundamentals of Motor Fitness.** I, II; 1. BULLOCK, HOUSTON, MILES, MILLER.

**101. Individual Gymnastics.** Recommendation from the Department of Health Service is necessary for registration in this course. I, II; 1. SCHNAUBER.

**102. Modified Activities.** Prescribed recreational sports, relaxation, and exercise. Recommendation from the Department of Health Service is necessary for registration in this course. I, II; 1. SCHNAUBER.

**105. Elementary Rhythms.** I, II; 1. ERLANGER, FREEMAN, TURNER.

**106. Intermediate Rhythms.** I, II; 1. Prerequisite: Physical Education for Women 105, or consent of instructor. ERLANGER.

**110. Elementary Swimming.** I, II; 1. BULLOCK, MILES, MILLER, NIELSEN.

**111. Sub-Intermediate Swimming.** For those whose skill is not sufficient to permit registration in intermediate swimming. I, II; 1. BULLOCK, MILES, NIELSEN.

**112. Intermediate Swimming.** I, II; 1. BULLOCK, NIELSEN.

**113. Advanced Swimming and Diving.** I, II; 1. Prerequisite: Physical Education for Women 112, or equivalent. BULLOCK.

**114. Life Saving.** I, II; 1. Prerequisite: Physical Education for Women 112, or equivalent. MILLER, NIELSEN.

**115. Synchronized Swimming.** I; 1. Prerequisite: Physical Education for Women 112. BULLOCK, TURNER.

**120. Hockey.** I, II; 1. WAGNER.

**121. Soccer.** I, II; 1. GRAY, HITE.

**122. Speedball.** I, II; 1. HITE, MILES.

**123. Basketball.** I, II; 1. BOOKER, GRAY, MILLER, NIELSEN, WAGNER.

**124. Volleyball.** I, II; 1. GRAY, MILES, WAGNER.

**125. Softball.** I, II; 1. MILES, MILLER, WAGNER.

**130. Badminton.** I, II; 1. BULLOCK, HITE, MILLER.

**131. Golf.** I, II; 1. LAWSON.

**132. Bowling.** I, II; 1. BOOKER, HITE, MILLER.

**133. Fencing.** I, II; 1. BOOKER.

134. **Ice Skating and Tennis.** I, II; 1. BOOKER, HOUSTON, MILLER, ROBERTSON.

135. **Archery.** I, II; 1. HITE, SCHNAUBER.

142. **Ballroom Dance.** Same as Physical Education for Men 142. I, II; 1. NIELSEN.

143. **American Square Dance.** Same as Physical Education for Men 143. I, II; 1. ERLANGER, FREEMAN.

## Professional Courses for Undergraduates

150. **Professional Orientation.** Introduction to the fields of physical education, health, safety, recreation, dance. I, II; 2. HOUSTON.

151. **Body Mechanics and Gymnastics.** Skill in fundamental body movements, posture, and physical conditioning. I, II; 1. HOUSTON, HUELSTER, SCHNAUBER.

152. **Basketball and Softball.** Skills, rules, team tactics. II; 1. BOOKER, WAGNER.

153. **Soccer and Volleyball.** Skills, rules, team tactics. I; 1. HITE, MILES.

154. **Tumbling and Apparatus.** Skills and stunts. II; 1. GRAY, HOUSTON.

155. **Bowling and Tennis.** Skills, rules, tactics I; 1. MILLER.

165. **Teaching of Swimming.** II; 2. Prerequisite: Sophomore or junior standing; Physical Education for Women 112. BULLOCK.

166. **Games for Children.** Same as Physical Education for Men 166. Games for classroom, playground, and gymnasium. Programs, lesson planning, and source materials. I, II; 2. DROM, LAWSON.

## Professional Courses for Advanced Undergraduates

200. **Speedball and Hockey.** Skills, rules, team tactics. I; 1. HOUSTON, WAGNER.

201. **Badminton.** Skills, rules, team tactics I, II; 1. MILLER.

202. **Archery and Golf.** Skills, rules, tactics. II; 1. LAWSON, SCHNAUBER.

204. **Organization of Physical Education.** Organization of the high school program in physical education. I; 3. Prerequisite: Senior standing. ROBERTSON.

205. **Tests and Measurements in Health, Physical Education, and Recreation.** Body type, organic, body mechanics, motor fitness, physical ability, and knowledge tests. I or II; 3. Prerequisite: Junior or senior standing. BOOKER.

206. **Kinesiology.** Mechanics and muscular action of balance and movement of the human body. I or II; 3. Prerequisite: Physiology 104 and 105; junior standing. HUELSTER.

208. **Theory of Prescribing Exercise.** Prescription and conduct of recreational and exercise programs for selected physical handicaps. I or II; 3. Prerequisite: Physical Education for Women 206. SCHNAUBER.

209. **History of Sport and Physical Education.** Development of sport and physical education in Europe and the United States since 1750. I or II; 2. Prerequisite: Junior standing, or consent of instructor. BOOKER.

210. **Inspection Trip.** Visitation and inspection of physical education, health, safety, and recreation programs in public and private institutions. II; no credit. LAWSON.

213. **Teaching of Sports.** Lectures, assigned readings, and practice teaching in University physical education classes. I; 4. Prerequisite: Physical Education for Women 151, 152, 153, 155, or consent of instructor; junior standing. BOOKER, ROBERTSON, WAGNER.

214. **Teaching of Sports.** Lectures, assigned readings, and practice teaching in University physical education classes. II; 4. Prerequisite: Physical Education for Women 151, 152, 153, 155, or consent of instructor; junior standing. BOOKER, ROBERTSON, WAGNER.

215. **Games and Sports for High School Girls.** Program planning and techniques. S; 2. ROBERTSON.

220. **Physical Education for the Classroom Teacher.** Same as Physical Education for Men 220. Methods and materials in physical education applicable to all grade levels. I, II; 2. Prerequisite: Junior standing. DROM.

221. **Supervision of Physical Education in Elementary Schools.** Same as Physical Education for Men 221. Purposes, methods, and materials. I, II; 3. DROM.

# PHYSICS

*Professors:* F. W. LOOMIS (Head of Department, on leave), G. M. ALMY (Acting Head of Department), J. H. BARTLETT, W. BLEAKNEY (Visiting), S. M. DANCOFF (on leave), D. W. KERST, P. G. KRUGER, A. T. NORDSIECK, L. N. RIDENOUR (on leave), F. SEITZ, F. R. WATSON (Emeritus).

*Associate Professors:* J. S. ALLEN, R. B. DUFFIELD, A. O. HANSON, R. D. HILL, J. S. KOEHLER, A. LONGACRE (on leave), E. M. LYMAN, R. J. MAURER, R. E. MEAGHER, R. F. PATON, H. QUASTLER, W. L. SCHULZ (Emeritus), C. W. SHERWIN.

*Assistant Professors:* P. AXEL, R. A. BECKER, J. BLATT, G. F. CHEW, R. I. HULSIZER, W. K. JENTSCHKE, L. S. LAVATELLI, P. M. MARCUS, F. R. METZGER, R. D. RAWCLIFFE, C. S. ROBINSON, A. WATTENBERG.

*Instructors:* G. ASCOLI, D. LAZARUS, D. E. MAPOTHER, C. P. SLICHTER, J. H. SMITH, J. N. SNYDER.

*Associates:* D. L. DEXTER, E. L. GOLDWASSER, W. R. HELLER, R. E. NORBERG, E. A. PEARLSTEIN, L. M. SLIFKIN, E. J. ZIMMERMAN.

*Assistants:* J. F. ASCHNER, A. L. ATKINS, M. Q. BARTON, D. N. BESHERS, J. S. BLAIR, J. C. BOWE, G. R. BRIGGS, H. N. BROWN, J. C. BUCHTA, W. A. BUTLER, H. G. COOPER, C. D. CURTIS, MARCIA DOOLITTLE, D. B. DUTTON, F. S. EBY, P. D. EDWARDS, C. R. EMIGH, R. D. ERICKSON, P. C. FISHER, M. GARBER, F. H. GILES, M. J. GLAUBMAN, R. F. GOODRICH, P. J. HAIGH, D. F. HOLCOMB, I. W. JANNEY, J. W. KAUFFMAN, H. W. KNOEBEL, J. J. KOVALY, W. E. KREGER, J. S. LAWSON, J. E. LEISS, Y-Y LI, H. LUSTIG, C. A. MACKLIET, G. E. MADER, J. H. MALMBERG, E. B. MCNEIL, R. C. MILLER, F. E. MILLS, H. J. MOODY, T. N. MORGAN, W. G. MOULTON, B. H. MULLER, R. NILSON, J. W. OSBORNE, J. OVADIA, F. S. PALUBINSKAS, L. S. PEDROTTI, R. V. PEIRCE, A. S. PENFOLD, M. T. PIGOTT, R. G. POHL, W. C. PROTHE, A. G. REDFIELD, R. A. REITZ, M. E. REMLEY, G. W. RODEBACK, R. A. RUBENSTEIN, D. SCHIFF, W. W. SCHRIEVER, F. J. SHORE, S. SINGER, E. SONDER, A. SOSIN, L. P. STEPHENSON, R. F. TUCKER, W. O. UNRUH, J. H. WEGSTEIN, S. WU.

## Requirements for L.A.S. Students

**Major:** Twenty hours in physics including Physics 321, 341, and 342, and excluding courses with numbers lower than 270.

**Minors:** Twenty hours in one or two of the following subjects, with not less than eight hours in each if two are chosen: astronomy, chemistry, education, geology, mathematics, zoology, or any one branch of engineering.

For undergraduate students taking advanced work or a major in physics, the following courses are suggested: First year: Trigonometry and analytic geometry. Second year: Physics 103, 104, and calculus. Third year: Physics 281, 321, 322, 341, 342, 343, and 360. Fourth year: Physics 344, 371, 372, 373, 374, 381, and 382.

Physics 101 and 102 are recommended to premedical, predental, and architecture students not specializing in physics, mathematics, chemistry, or engineering.

The general physics prerequisite for certain courses may be satisfied by either Physics 103 and 104 or Physics 101 and 102. The calculus prerequisite may be satisfied either by Mathematics 132 and 142 or Mathematics 137 and 147.

Physics 351 and 352 are recommended for students in zoology, physics, and chemistry who expect to do advanced undergraduate or graduate work in biophysics or biochemistry.

## Courses for Undergraduates

**101. General Physics (Mechanics, Heat, and Sound).** Lectures with demonstrations, recitations, and laboratory. For students in arts and sciences, and architecture. I, II; 5. Prerequisite: Trigonometry. HILL, PATON, and others.

**102. General Physics (Light, Electricity, and Magnetism).** Lectures with demonstrations, recitations, and laboratory. For students in arts and sciences, and architecture. I, II; 5. Prerequisite: Physics 101. PATON and others.

**103. General Physics (Mechanics, Heat, and Sound).** Lectures with demonstrations, recitations, and laboratory. For students in engineering, mathematics, physics, and chemistry. I, II; 5. Prerequisite: Registration in Mathematics 132 or 137. LAZARUS, SNYDER, and others.

**104. General Physics (Electricity, Magnetism, Light, and Modern Physics).** Lectures with demonstrations, recitations, and laboratory. For students in engineering, mathematics, physics, and chemistry. I, II; 5. Prerequisite: Physics 103. LAZARUS, SNYDER, and others.

## Courses for Advanced Undergraduates

**232. Physics of Music.** Primarily for students majoring in music. Wave motion; factors determining pitch and loudness; temperament and harmony; interference; tone quality, harmonic analysis, synthesis of tones; evaluation of instruments and reproducing devices; mechanism of speech and singing; mechanisms of hearing; pitch and loudness discrimination; acoustics of rooms and halls. I, II; 2 hours, or ½ unit. Only students majoring in music or speech may obtain graduate credit for this course. Prerequisite: Two years of high school mathematics. DANCOFF.

**260. Elementary Heat.** Lectures and recitations. Primarily for students in ceramics. Temperature measurement, specific heats, theory of heat transfer, thermal stresses. Elementary thermodynamics as applied to equilibrium phenomena. II; 3. Prerequisite: General Physics and calculus. PATON.

**270. Intermediate Light.** Lectures and laboratory. Emphasis on the needs of students in illumination engineering. I, II; 3. Prerequisite: General physics and calculus. RAWCLIFFE.

**281. Intermediate Atomic Physics.** Elementary particles, radiation, simple spectra and relation to extranuclear structure, radioactivity, nuclear processes. I, II; 3. Prerequisite: General physics and calculus. ALLEN, AXEL.

## Courses for Advanced Undergraduates and Graduates

**321. Theoretical Mechanics.** Lectures and problems. Physics 321 and 322 are fundamental to many advanced courses and should be elected as early as possible by those intending to specialize in physics. Laws of motion, vectors, statics, energy and momentum principles for a particle and for systems of particles, motion of a particle under constant forces, plane motion of a rigid body, simple harmonic motion and resonance, impact. I, II; 3 hours, or 1 unit. Prerequisite: General physics and calculus. BECKER, SLICHTER.

**322. Theoretical Mechanics.** Continuation of Physics 321. Motion of a particle under a variable force, central field motion, accelerated reference systems, motion of a particle subject to constraints, rotation of a rigid body, dimensions, vibrating systems and normal coordinates, generalized coordinates. I, II; 3 hours, or 1 unit. Prerequisite: Physics 321. BECKER, SLICHTER.

**330. Sound.** Lectures and problems. Fundamentals of wave motion as related to sound and vibration; propagation, reflection, refraction, interference, and diffraction of sound; production and properties of sound waves and musical tones. Some applications of sound theory; musical instruments, recording and reproduction; the ear, signaling devices, and architectural acoustics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus. AXEL.

341. **Electricity and Magnetism.** Lectures, problems, and laboratory. This course is fundamental to advanced courses and should be elected as early as possible by those intending to specialize in physics. Electrostatics, dielectrics, D.C. circuits and instruments, thermionic emission. I; 3 hours, or 1 unit. Prerequisite: General physics and calculus; registration in Mathematics 341 or 343, or consent of instructor. HANSON and others.

342. **Electricity and Magnetism.** Continuation of Physics 341. Magnetic fields due to currents; self and mutual inductance; permeable media, hysteresis, paramagnetism, diamagnetism, and ferromagnetism; motion of charges in electric and magnetic fields; A.C. circuits, transmission lines; Maxwell's equations, electromagnetic waves, and radiation. II; 3 hours, or 1 unit. Prerequisite: Physics 341. HANSON and others.

343. **Vacuum Tube Circuits.** Lectures, problems, and laboratory. Elementary theory and applications of vacuum tubes as linear circuit elements in amplifiers and electronic instruments. Emphasis on experimental techniques. II; 4 hours, or 1 unit. Prerequisite: Physics 341. AXEL and others.

344. **Vacuum Tube Circuits.** Continuation of Physics 343. Electronic instruments and techniques used in research in physics. Advanced theory and experiments emphasizing the use of vacuum tubes as non-linear circuit elements: multi-vibrators, blocking oscillators, pulse generators, and amplifiers; Geiger counter circuits, synchronizing and time-measuring circuits. Familiarization with instruments and techniques used in research in physics. I; 4 hours, or 1 unit. Prerequisite: Physics 343, or equivalent. LYMAN and others.

351. **Biophysics.** Effect of light and ionizing radiations on living matter, including photosynthesis, phototropism, and vision. I; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. BARTLETT.

352. **Biophysics.** Continuation of Physics 351. II; 3 hours, or 1 unit. Prerequisite: Physics 351, or consent of instructor. BARTLETT.

354. **Biophysics Laboratory.** Laboratory experiments in optics, electricity, and nuclear physics designed to familiarize the student with the physical apparatus and techniques useful in biophysics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. RAWCLIFFE.

360. **Heat.** Lectures and recitations. Definition and measurement of thermodynamic functions such as temperature, entropy, enthalpy, etc.; heat conversion and transfer; equilibrium and cyclic phenomena; thermal radiation; energy exchanges at very low and very high temperatures. II; 3 hours, or 1 unit; 2 hours, or ½ unit for students who have credit for Physics 260. Prerequisite: General physics and calculus. MAURER.

362. **Kinetic Theory of Gases.** A lecture and problem course presenting the theory of gases and treating such topics as the distribution law, viscosity, diffusion, thermal conduction, thermodynamic properties, and some of the fundamentals of the statistical method. I, II; 3 hours, or 1 unit. Prerequisite: General physics and calculus. MAURER.

371. **Light.** Lectures. Geometrical optics with emphasis on application to instruments, interference, and diffraction. I; 2 hours, or ½ unit. Prerequisite: General physics and calculus. ALMY.

372. **Light.** Continuation of Physics 371. Electromagnetic character of light, Maxwell's equations, theory of reflection and refraction, polarization, double refraction, crystal optics, dispersion, scattering, optical properties of metals. II; 2 hours, or ½ unit. Prerequisite: Physics 371. ALMY.

373. **Light Laboratory.** To accompany Physics 371. I; 2 hours, or ½ unit. Prerequisite: Registration in Physics 371. ALMY and others.

374. **Light Laboratory.** Continuation of Physics 373. To accompany Physics 372. II; 2 hours, or ½ unit. Prerequisite: Registration in Physics 372. ALMY and others.

381. **Atomic Physics.** A lecture and problem course presenting our modern knowledge of the several physical constants and of the nature and properties of atoms and atomic spectra, molecules and molecular spectra, electrons, light quanta, the photoelectric

effect, and the Compton effect. I; 3 hours, or 1 unit. Prerequisite: General physics and calculus. KRUGER.

382. **Radioactivity and Nuclear Physics.** A lecture and problem course presenting our modern knowledge of the properties of nuclear particles, natural and artificial radioactivity, laboratory equipment for producing and studying high energy particles, nuclear disintegrations, the interaction of nuclear particles with each other and with matter, cosmic rays, and the application of nuclear phenomena to some practical problems. II; 3 hours, or 1 unit. Prerequisite: Physics 381. KRUGER.

# PHYSIOLOGY

*Professors:* R. E. JOHNSON (Head of Department), K. J. FRANKLIN (Visiting), C. L. PROSSER, F. R. STEGGERDA.

*Associate Professors:* H. L. QUASTLER, A. B. TAYLOR.

*Assistant Professors:* W. P. ELHARDT, F. SARGENT, V. J. WULFF.

*Instructors:* J. D. ANDERSON, RUTH T. KROUSE, S. G. STOLPE, G. C. WICKWIRE.

*Assistants:* D. BEYER, W. A. BOYD, C. C. CAPP, J. V. CATALANO, A. S. LING, C. E. MELTON, A. PANDAZI, P. B. PHINNEY, J. PRAGLIN, N. J. SIDERIUS, V. J. WILSON, J. W. YUSKEN.

## Requirements for L.A.S. Students

**Major:** Twenty hours in animal physiology, of which ten or more must be from departmental courses in the advanced group. In addition, the student's program must include one semester each of vertebrate embryology, organic chemistry and physical chemistry (either Chemistry 247 or Chemistry 240 and 241), and two semesters of general physics. Calculus is recommended strongly.

The following courses may be counted toward the twenty required hours: Physiology 105, Physiological Anatomy; Animal Nutrition 301, Introduction to Animal Nutrition; Biological Sciences 332, Photobiology; Chemistry 350, Biochemistry; Entomology 323 and 324, Insect Physiology.

**Minors:** A total of twenty hours in one or two of the following: bacteriology, botany, chemistry, entomology, mathematics, physics, zoology. At least eight hours must be taken in each field if two are chosen.

## Courses for Undergraduates

NOTE: Division of General Studies 131 and 132 may be substituted for a semester of physiology in satisfying prerequisites.

103. **Introduction to Human Physiology.** The functioning of the human body as a whole, and the interrelations of various organs and systems. When this course is followed by Psychology 103, the general education requirements in biological sciences are fulfilled. (Note: This course replaces Physiology 100, 101, 102, 110, and 111 and meets curricular requirements for students in home economics, speech, nursing, and engineering.) Lectures, discussion, demonstration, and laboratory. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Not open to students who have taken Physiology 104, 105, or 134. KROUSE, TAYLOR.

104. **Physiological Anatomy.** Physiology and anatomy of the bony structures, ligaments, and muscles of the human body. I; 5. ELHARDT.

105. **Physiological Anatomy.** Physiology and anatomy of the human body. Topics covered include: nervous system; respiration; circulation; digestion; diets, metabolism, and vitamins; endocrinology; and reproduction. II; 5. Prerequisite: Physiology 104, or consent of instructor. ELHARDT.

106. **Physiology of the Nervous System and Special Senses.** For students in speech correction and teaching of the hard of hearing. I or II; 3. Prerequisite: Sophomore stand-

ing; four hours of physiology, zoology, or general biology, including two hours o laboratory work each week. WICKWIRE.

134. **Human Anatomy and Physiology.** A study of the essentials of anatomy and physiolog with special reference to the muscular and nervous systems. For students of occup tional therapy and nursing. I; 5. Prerequisite: Zoology 101, or consent of instructo WICKWIRE.

### Courses for Advanced Undergraduates

208. **Individual Topics.** I; 3 to 5. Prerequisite: Fifteen hours of physiology; senior stand ing. STAFF.

209. **Individual Topics.** II; 3 to 5. Prerequisite: Fifteen hours of physiology; senior stand ing. STAFF.

235. **Kinesiology.** A study of the mechanics and motion of the human body emphasizin abnormal conditions and with special relation to reeducation of muscle groups. II; 3 Prerequisite: Physiology 134. WICKWIRE.

### Courses for Advanced Undergraduates and Graduates

306. **Advanced Mammalian Physiology.** The significance of muscle, nerve, blood, and circu lation in mammalian physiology. I; 5 hours, or 1 unit. Prerequisite: Courses totalin twenty hours in chemistry, animal biology, or both, beyond the introductory fresh man courses; consent of instructor. STEGGERDA. STOLPE, WULFF.

307. **Advanced Mammalian Physiology.** The significance of respiration, digestion, metabo lism, excretion, temperature regulation, and hormones in mammalian physiology. II 5 hours, or 1 unit. Prerequisite: Courses totaling twenty hours in chemistry, anima biology, or both, beyond the introductory freshman courses; consent of instructo STEGGERDA, STOPLE, WULFF.

331. **Physicochemical Biology. Part I: Radiobiology.** Same as Biological Science 331 and Botany 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit Prerequisite: One year each of biology, physics, chemistry, and mathematics.

333. **Physicochemical Biology. Part III: Electrobiology.** Same as Biological Science 333 and Botany 333. Electrobiology, potentials produced by and effects of potentials upon liv ing organisms. Lectures, student reports, and demonstrations. I or II; 3 hours, or 3 unit. Prerequisite: Ten hours in biology, four hours in physical chemistry, ten hour in physics. Offered in alternate years. PROSSER.

361. **Comparative Physiology.** Same as Zoology 361. A comparison of the general physiology of different groups of animals. I; 5 hours, or 1 unit. Prerequisite: Senior standing three semesters of animal biology, two semesters of chemistry. ANDERSON, PROSSER.

362. **Cellular Physiology.** Same as Zoology 362. A physicochemical analysis of biological functions common to most living cells. II; 5 hours, or 1 unit. Prerequisite: Senio standing; two semesters each of biology and general physics; three semesters of chem istry. ANDERSON, PROSSER.

363. **Endocrinology.** Same as Zoology 363. The glands of internal secretion with specia reference to the vertebrates. I; 5 hours, or 1 unit. Prerequisite: One semester of ele mentary zoology or physiology; Zoology 334, or organic chemistry; senior standing HALL.

## PLANT PATHOLOGY

*Professors:* H. W. ANDERSON, B. KOEHLER, M. B. LINFORD.

*Associate Professors:* W. M. BEVER (Chairman of Plant Pathology Committee), M. B. LINN, D. POWELL, L. SHANOR, H. H. THORNBERRY, F. F. WEINARD.

*Assistant Professors:* J. W. GERDEMANN, D. GOTTLIEB.

## Courses for Advanced Undergraduates and Graduates

**Botany 372. General Mycology.** Structure, classification, and identification of fungi, including those of economic importance. II; 4 hours, or 1 unit. Prerequisite: One year of botany, bacteriology, entomology, or zoology; senior standing, or consent of instructor. SHANOR.

**307. Fruit Diseases.** Same as Botany 307 and Horticulture 307. Symptomatology, control measures. Laboratory and field studies of representative diseases. I; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317 or Botany 372. Offered in 1951-1952 and in alternate years. ANDERSON.

**308. Vegetable and Canning Crops Diseases.** Same as Botany 308 and Horticulture 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317, or Botany 372. Offered in 1952-1953 and in alternate years. LINN.

**317. Plant Pathology.** Same as Agronomy 317, Botany 317, and Horticulture 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. LINFORD.

**377. Diseases of Field Crops.** Same as Agronomy 377 and Botany 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317 or Agronomy 121, or consent of instructor. BEVER, GERDEMANN.

**379. Research Methods in Plant Pathology.** Same as Agronomy 379, Botany 379, and Horticulture 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317; senior standing. GERDEMANN, GOTTLIEB, THORNBERRY.

# POLITICAL SCIENCE

*Professors:* C. M. KNEIER (Chairman of Department), C. A. BERDAHL, R. DANGERFIELD, L. L. DURISCH (Visiting), J. M. MATHEWS, C. F. SNIDER, F. G. WILSON.

*Associate Professors:* C. B. HAGAN, V. JOBST, E. G. LEWIS.

*Assistant Professors:* M. EDELMAN, N. F. GARVEY, G. MANNER, P. MONYPENNY.

*Instructors:* J. A. RANNEY, R. E. SCOTT.

*Assistants:* S. F. JAENKE, D. B. JOHNSON, D. T. KENNEY, J. N. MURRAY, E. E. ROADY, W. C. WIMBERLY.

## Requirements for L.A.S. Students

**Major:** Twenty hours from courses offered by the Department of Political Science. A major may include three hours of constitutional history (History 345, 346, 369, or 370).

**Minors:** Twenty hours selected from one or two of the following subjects: economics, education, history, law, library science, philosophy, social welfare administration, and sociology and anthropology. At least eight hours must be taken in each subject, if two are chosen. The curriculum in international affairs or that in Latin American studies or in medieval civilization will be accepted as a minor.

Courses 150 and 151 give a general survey of national, state, and local government in the United States. Undergraduates beginning the study of political science are advised to take, first, courses 150 and 151, and those planning for advanced work should take those courses in the sophomore year.

## Courses for Undergraduates

101. **Principles and Problems of Government.** Origins and development of government; the individual and society; theories as to the purposes of government; forms of government; problems of government organization and administration; constitutions and constitution making; the legislative, administrative, and judicial process; present problems with respect to popular control, governmental power, liberty, business, agriculture, labor, general welfare, national defense, finance, foreign relations. I; 4. Designed, with Political Science 102, to satisfy the general education requirement in social science. Neither semester may be taken separately. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. Prerequisite: Sophomore standing. RANNEY.

102. **Principles and Problems of Government.** Origins and development of government; the individual and society; theories as to the purposes of government; forms of government; problems of government organization and administration; constitutions and constitution making; the legislative, administrative, and judicial process; present problems with respect to popular control, governmental power, liberty, business, agriculture, labor, general welfare, national defense, finance, foreign relations. II; 4. Designed, with Political Science 101, to satisfy the general education requirement in social science. Neither semester may be taken separately. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. Prerequisite: Political Science 101. RANNEY.

110. **Government in Illinois.** Primarily for students who do not take Political Science 150 or 151. I; 2. Prerequisite: Sophomore standing. SNIDER.

150. **American Government:** Organization and Powers. Historical development and organization of national, state, and local governments; the federal system; national and state constitutions; civil and political rights; party system; nature, structure, powers, and procedure of legislative, executive, and judicial departments in state and nation. I, II; 3. Prerequisite: Sophomore standing. EDELMAN, GARVEY, JAENKE, JOBST (in charge), JOHNSON, KENNEY, KNEIER, LEWIS, MATHEWS, MONYPENNY, MURRAY, RANNEY, ROADY, SCOTT, SWANSON, WILSON, WIMBERLY.

151. **American Government: Functions.** Functions of national, state, and local governments; foreign relations and national defense; taxation and finance; law enforcement: police power; regulation of commerce, communications, and business; promotion of social and economic welfare; current problems. I, II; 3. Students may not receive credit for both Political Science 151, and 101 and 102. Prerequisite: Sophomore standing: Political Science 150, or consent of department. HAGAN, JOBST (in charge), LEWIS, MANNER, MONYPENNY, SNIDER.

## Courses for Advanced Undergraduates

262. **Politics and Administration.** An introduction to the problem of securing popular control of the administrative function of government. Popular control of administrative agencies through the executive and legislative branches, and influence of administrative agencies in the formation and adoption of governmental policy. I or II; 3 hours. Prerequisite: Political Science 150.

291. **Thesis and Honors Course.** I; 2 to 5. Open only to seniors whose major is political science and who have a general University average of at least 4.0. STAFF.

292. **Thesis and Honors Course.** II; 2 to 5. Open only to seniors whose major is political science and who have a general University average of at least 4.0. STAFF.

## Courses for Advanced Undergraduates and Graduates

305. **Municipal Government.** Growth of cities; their legal status; municipal politics and organization in the United States. I; 3 hours, or ½ to 1 unit. KNEIER.

306. **Municipal Problems.** Municipal administration in the United States; administrative organization; personnel problems; financial problems; city planning and housing;

police and fire administration; public health; public utilities. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing with Political Science 305, or Economics 102 and 103, or six hours of political science. KNEIER.

310. **Rural Local Government.** Development of local government in rural America; state-local relationships; legal status of local units; organization and functions of counties, townships, school districts, and special-purpose districts; rural politics and elections; local finance; problems of reorganization. II; 3 hours, or ½ to 1 unit. SNIDER.

312. **Advanced State Government.** Relations of the state with national, other state, and local governments; the state constitution and problems of revision; methods of popular control; nature, structure, powers, functions, and procedure of legislative, executive, judicial, and administrative organs of state government. II; 2 hours, or ½ to 1 unit. Prerequisite: Political Science 150, or equivalent. MATHEWS.

315. **Legislatures and Legislation.** The legislative function in government; structure and organization of American legislatures, national, state, and local; party organization in legislatures; legislative procedure; pressure groups and lobbying; relation of legislature to other branches of government; problems of legislative reorganization. I; 3 hours, or ½ to 1 unit. Prerequisite: Junior standing with six hours of political science.

321. **Government and the Economic Order.** A survey of public policies of national and state governments regulating economic activity; transportation, electrical utilities, communications, anti-monopoly, agriculture, level of economic activity. I; 3 hours, or ½ to 1 unit. Prerequisite: Any two courses in political science or a combination of political science and economics. HAGAN.

325. **Political Parties: Historical Development and Issues.** Nature of American party system; historical development of parties and issues; third or minor parties and their role. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

326. **Political Parties: Organization and Methods.** Organization and operation of the American party system; relations between national, state, and local organizations; state and national committees; the convention system; the primary; campaign methods and finance. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

331. **British Government.** Nature of the British constitution; the crown, ministry, and cabinet; Parliament and elections; the party system; law and the courts; local government; the British Commonwealth. I or II; 3 hours, or ½ to 1 unit. LEWIS.

336. **Continental European Governments and Politics.** An analysis of the major political systems of continental Europe; constitutional and legal structures of France, Germany, Italy, the Soviet Union, and Spain; factors in the struggle for power; political and social movements as they affect the European scene; relation of political to economic, religious, and social institutions in Europe. II; 3 hours, or ½ to 1 unit. LEWIS.

342. **Government and Politics in Latin America.** A survey of the origin and development of Latin American political institutions; systems of government; public administrative systems; party government; international policies of Latin American governments. I or II; 3 hours, or ½ to 1 unit. SCOTT.

343. **International Relations of Latin America.** Latin American position and objectives in international affairs, with emphasis on the Latin American viewpoint; the Monroe Doctrine; the Good Neighbor Policy; the Organization of American States and the United Nations; recent relations of specific nations. I or II; 3 hours, or ½ to 1 unit. SCOTT.

345. **Theory and Practice of Democratic Government.** Theories of the nature and conditions of democracy; contemporary democratic institutions compared and analyzed. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. RANNEY.

351. **American Constitutional System.** Judicial interpretation of constitution; separation of governmental powers; relation of state and national governments; control of interstate commerce; jurisdiction of courts. I; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. MATHEWS.

354. **The Constitution and Industrial Legislation.** Scope of national regulatory power; commerce clause, taxing power; spending power; scope of state regulatory power; police power and due process limitations. II; 3 hours, or ½ to 1 unit. Prerequisite: Any two courses in political science, or a combination of political science and economics. HAGAN.

356. **Administrative Law in the United States.** A study of the powers of administration, of the legal requirements for and the limits on the exercise of such powers, of the internal and external means of safeguarding individual rights, and of the enforcement of the responsibility of administrative officers both politically and legally. II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 305, 351, 354, or 361 (any one), or consent of instructor. MONYPENNY.

359. **Jurisprudence.** Nature and sources of law; law and the state; law and justice; evolution, arrangement and subject matter of law. I or II; 3 hours, or ½ to 1 unit. Prerequisite. Political Science 150, or equivalent. MANNER.

361. **Introduction to Public Administration.** Development of administrative organization; administration and the executive, legislature, and judiciary; principles of organization, including line and staff relationships; the staff services of finance and personnel; formal and informal control. I; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. MONYPENNY.

364. **National Administration.** Creation and development of the national administrative organization; the executive departments; regulatory, service, and staff agencies; special organization for emergency and war efforts at reorganization and coordination. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of political science, including either Political Science 150 or 151. BRADLEY.

365. **Theory and Administration of Federal Labor Law.** Same as Labor and Industrial Relations 365. Critical analysis of the relationship between group pressures on government and public policy affecting labor; role of administration in formation of policy; problems and experience of federal agencies operating in the labor fields. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. EDELMAN.

368. **Public Personnel Administration.** Same as Labor and Industrial Relations 368. An analysis of personnel management in government. Recruitment and selection, job and salary classification, work standards, training, and the role of labor and professional organizations in the public services considered in the light of current theory and practice. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 361, or consent of instructor. DURISCH.

371. **International Organization.** General development and basic principles of world organization; principles, structure, methods, and actual operation of international governmental institutions; special attention to the League of Nations, the United Nations, and related agencies. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

372. **International Organization.** The problem of war and security; pacific settlement of disputes; the functioning of the United Nations and other international agencies in respect to economic and social problems. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

373. **International Administration.** International administrative agencies: international unions and other agencies for functional purposes; organization, procedure, and personnel of international secretariats; budgets and financial administration; interternational territory; mandates and trusteeships. I or II; 2 hours, or ½ to 1 unit. Prerequisite: Political Science 371 or 372, or equivalent. BERDAHL.

381. **American Foreign Relations.** Participation in international affairs; presidential initiative; development and organization of the Department of State; diplomatic intercourse; consular service; treaty making power; development of foreign policy. I or II; 2 hours, or ½ to 1 unit. Prerequisite: Junior standing with six hours of political science. DANGERFIELD.

382. **Contemporary American Foreign Policies.** Study of the major foreign policy decisions currently confronting the United States government—analysis of background, principal issues, alternative actions; formulation of policies. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 381, or consent of instructor. DANGERFIELD.

384. **International Relations.** An examination of the nature of the national state system, of the forces affecting international relations, of the sources of conflicts in international politics, and of their solution by power politics or by international cooperation. I or II; 3 hours, or ½ to 1 unit. MANNER.

385. **International Law.** Nature, sources, and development of international law; rights and duties of states; law of peace and war. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing with six hours of political science. JOBST.

386. **International Law.** Continuation of Political Science 385. Nature, sources, and development of international law; rights and duties of states; law of peace and war. II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 385, or consent of instructor. JOBST.

391. **Principles of Political Science.** A survey and analysis of the modern state; methods of study in political science; sovereignty and the legal nature of the state; forces and interests in politics; forms of government; the nature of democracy and international society. I; 3 hours, or ½ to 1 unit. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. WILSON.

393. **History of Political Theory.** A survey of the major trends and issues in European political thought from ancient times to 1850. Greek and Roman theories of politics; the development of Christian political thought and the Middle Ages; political theory during Renaissance, Reformation, and the Counter Reformation; early modern absolutism, the emergence of constitutional government, and the theory of democracy; the Enlightenment, European liberalism, conservatism, Utopianism, and pre-Marxian socialism. I or II; 3 hours, or ½ to 1 unit. WILSON.

396. **Contemporary Political Theory.** Major tendencies in Western political theory since 1850; conservatism and constitutionalism; the religious interpretation of the state and economic institutions; Marxism, socialism, and communism; antidemocratic thought and totalitarian regimes. II; 3 hours, or ½ to 1 unit. WILSON.

397. **American Political Theory.** A survey of American political thought from colonial times to the present. I; 3 hours, or ½ to 1 unit. WILSON.

## PORTUGUESE

**(See Spanish and Italian)**

## PSYCHOLOGY

*Professors:* L. H. LANIER (Head of Department), R. B. CATTELL, G. D. HIGGINSON, C. M. LOUTTIT, L. L. MCQUITTY, O. H. MOWRER, L. I. O'KELLY, E. ROSS, R. STAGNER, H. WOODROW, P. T. YOUNG.

*Associate Professors:* JANET S. BLAKESLEE, R. M. COLLIER, W. M. GILBERT, T. W. HARRELL, L. A. HELLMER, A. L. IRION, W. G. MCALLISTER, C. E. OSGOOD, A. C. WILLIAMS.

*Assistant Professors:* GERTRUDE L. BATES, R. ELIZABETH BROWN, J. B. COHEN, S. S. DUBIN, T. N. EWING, W. A. GIBSON, D. A. GORDON, H. A. GRACE, G. R. GRICE, LEOTA L. JANKE, ALICE K. JONIETZ, R. P. LARSEN, P. V. MARCHETTI, W. G. MATHENY, D. S. POMEROY (on leave), G. J. WISCHNER.

*Instructors:* KATHRYN G. HANSEN, MARTHA HEATON.

*Assistants:* ESTHER E. GOULD, L. M. GUSTAFSON, C. O. HOPKINS, J. W. KLING, J. D. LYONS, J. E. NYGAARD, R. B. SHATEL, L. J. SHERMAN, J. R. SKEEN, R. G. STEWART, A. L. STRAND, P. W. WENIG.

### Requirements for L.A.S. Students

**Major:** Twenty hours from courses offered by the Department of Psychology, excluding Psychology 100, 103, and 105.

**Minors:** Twenty hours chosen from not more than two of the following subjects: economics, curriculum in international affairs, education, mathematics, philosophy, physiology, political science, social welfare administration, sociology, and zoology. At least eight hours must be taken in each, if two are chosen.

Students who plan to do graduate work in psychology should take a laboratory course in experimental psychology and a course in statistics. It is recommended also that they take courses in the natural sciences, in the social sciences, and especially in mathematics. Intensive concentration in psychology is undesirable for the prospective graduate student. The study of French and German is strongly recommended.

## Courses for Undergraduates

100. **Introduction to Psychology.** Introductory analysis and description of human behavior with special reference to observation, learning, memory, thinking, emotional life, and personality development. Major emphasis is placed upon psychological principles as they relate to daily life and everyday problems. Not open to students electing Psychology 103 or 105 and 106. I, II; 4. Prerequisite: Sophomore standing. IRION, MARCHETTI, MCALLISTER, and others.

103. **Human Behavior.** A comprehensive introduction to facts, principles, and applications of psychology. Together with Physiology 103, this course forms an eight-hour sequence satisfying the general education requirements in biological sciences. Not open to students electing Psychology 100 or 105. I, II; 4. Prerequisite: Physiology 103. GORDON and others.

105. **Human Nature.** Biological and social determinants of human nature; development of personality; facts, principles, and applications of modern psychology. The first half of an eight-hour sequence satisfying the general education requirement in the Division of Social Sciences. Not open to students electing Psychology 100 or 103. I; 4. YOUNG and others.

106. **Human Nature.** Biological and social determinants of human nature; development of personality; facts, principles, and applications of modern psychology. The second half of an eight-hour sequence satisfying the general education requirement in the Division of Social Sciences. Not open to students electing Psychology 100 or 103. II; 4. Prerequisite: Psychology 105. YOUNG and others.

130. **Experimental Psychology.** Employment and understanding of experimental methods in psychology. I, II; 2. Prerequisite: Credit or registration in Psychology 100, 103, or 106. COHEN, HIGGINSON, and others.

135. **Statistical Methods in Psychology.** Application of elementary statistical methods to psychological data. No credit for this course will be given to students who receive credit for Economics 170 or Mathematics 161. I, II; 3. Prerequisite: Psychology 100, 103, or 106. COHEN, GIBSON, WOODROW.

145. **Industrial Psychology.** Psychology of industrial work and management-employee relationships. I, II; 3. Prerequisite: Psychology 100, 103, or 106; credit or registration in a course in statistics. DUBIN, MARCHETTI.

150. **Personality and Social Behavior.** An introduction to the study of personality in relationship to the social environment. Application of psychological principles to social problems. I, II; 3. Prerequisite: Psychology 100 or 103. Not open to students who have had Psychology 105 and 106.

183. **Psychology of Adjustment.** An introductory study of motivational and interpersonal relationships, with special emphasis upon frustration, conflict, and adjustment mechanisms. I, II; 3. Prerequisite: Psychology 100, 103, or 106. COLLIER.

## Courses for Advanced Undergraduates

216. **Child Psychology.** A study of the psychological development of the child. I, II; 3. Prerequisite: Psychology 100, 103, or 106. BROWN, GORDON, HEATON, WISCHNER.

220. **Fields of Psychology.** A functional approach to man's psychological development and his institutionalization; the role of psychology in society, industry, law, education, and medicine. I, II; 4. HIGGINSON.

246. **Engineering Psychology.** The use of psychological data and methods of research with respect to problems of equipment design and man-machine relations. I, II; 3. Prerequisite: Psychology 100 or 103, or consent of instructor. MATHENY.

250. **Psychology of Personality.** Methods of investigating personality; biological factors in personality; the learning process and motivation as related to the development of personality; the structure of personality. I, II; 3. Prerequisite: Psychology 100 and 150, or Psychology 105 and 106.

255. **Social Psychology.** The systematic study of the social behavior of the individual and the group. Particular attention is given to social perception, motivation, and learning; attitudes and values; the development and dynamics of social groups; interaction among groups. I, II; 3. Prerequisite: Psychology 100 and 150, or Psychology 105 and 106.

290. **Introduction to Psychological Tests and Measurement.** Basic concepts of psychological measurement; characteristics of a good test; interpretation of test results. Introduction to tests of intelligence, special abilities, aptitudes, achievement, personality, and interests. I, II; 3. Prerequisite: Psychology 100, 103, or 106; a course in statistics. GIBSON, MARCHETTI.

291. **Honors Course.** For major students and candidates for honors. I; 2. Prerequisite: Senior standing; consent of instructor. GRACE.

292. **Honors Course.** For major students and candidates for honors. II; 2. Prerequisite: Senior standing; consent of instructor. GRACE.

## Courses for Advanced Undergraduates and Graduates

311. **Physiological Psychology.** A study of the physiological basis of behavior, including sensory processes, motivation, emotion, learning, and intelligence. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology; physiology 103 or 106, or Zoology 101.

326. **Motivation and Emotion.** The nature and development of emotion, attitude, motive, and the role of these processes in social adjustment. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology. YOUNG.

330. **Advanced Experimental Psychology.** A survey of experimental techniques and subject matter in the fields of psychophysics and measurement, sensory processes, attention and perception, motivation and emotion, learning and memory, motor activity. Lectures and laboratory. I, II; 4 hours, or ½ to 1 unit. Prerequisite: Psychology 100, 103, or 106; a course in statistics.

338. **Abnormal Psychology.** An introduction for preprofessional students to the psychological aspects of the behavior disorders, including study of the insanities, psychoneuroses, mental deficiencies, and other conditions. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology; junior standing except for those in the premedical curriculum who may take the course as second semester sophomores with four hours of psychology. IRION.

345. **Comparative Psychology.** Animal behavior with particular reference to the behavior of vertebrates. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours credit in psychology, or Psychology 100, 103, or 106, and one course in zoology. MCALLISTER.

348. **The Psychology of Learning.** A survey of the basic facts and theories of the learning process. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology. GRICE.

353. **Psychology of International Relations.** Psychological insights into the problems of international relations: nationalism, war and peace, international conferences. Individual differences due to nationality differences and the problems raised by international contacts. II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100 and any

one of the following: Psychology 150, Sociology 110, 212, or Anthropology 260; and, in addition, three hours of advanced courses in the international affairs curriculum. Foreign students by consent of instructor. GRACE.

357. **Psychology of Industrial Conflict.** Same as Labor and Industrial Relations 357. An analysis, in terms of the behavior of individuals, of the causes and possible solutions of industrial conflict. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100, or equivalent; Psychology 145, or Economics 240, or Sociology 318. STAGNER.

378. **Perception.** Principles of perception; perception of space, time, and motion. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology.

383. **Student Counseling.** The application of psychological principles and techniques in fitting education processes to the needs, interests, and abilities of the individual college student. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 338; a course in statistics; senior standing. EWING, JONIETS.

## RECREATION

(See Physical Education)

## RHETORIC

(See English)

## RUSSIAN

(See French)

## SECRETARIAL TRAINING

(See Business Organization and Operation)

# SOCIAL SCIENCES

### Courses for Undergraduates

101. **Latin American Civilization: The Caribbean.** I; 3. HAMILTON and others.

102. **Latin American Civilization: South America.** A survey of the history, politics, geography, economics, literature, and art of the South American area. This course is required for a minor in Latin American studies. II; 3. HAMILTON and others.

111. **The Individual in Society.** A general education course designed to equip the beginning student with an understanding of the nature and the role of the individual as a member of the several groupings of his social community. I, II; 4.

112. **Bases of American Life.** A general education course designed to acquaint the student with adequate knowledge of the physical, economic, political, and social developments of the United States, and to equip him for intelligent active participation in local and national life. I, II; 4.

113. **World Patterns and World Problems.** A general education course designed to bring the student to an understanding of the geographic, economic, and political bases of the present world situation. I, II; 4.

114. **The Unity of Knowledge.** A general education course designed to acquaint the student with the development of philosophical and scientific disciplines in intellectual history, and to equip him to direct his further general education by his awareness of the integrative factors in current education and culture. I, II; 4. Prerequisite: Sophomore standing; 3.5 average.

### Courses for Advanced Undergraduates

282. **Seminar in International Affairs.** Required during the last semester of students majoring in international affairs and restricted to seniors majoring in this area. II; 3.

292. **Thesis and Honors.** Students majoring in international affairs and seeking to graduate with honors are required to write a thesis. This course will be required of all such students and is restricted to them. Only such majors whose general University average is 4.0 or better are eligible for this course. I, II; 2 to 4.

## SOCIAL WELFARE ADMINISTRATION

*Professor:* MARIETTA STEVENSON (Director of Division of Social Welfare Administration).

*Associate Professors:* R. J. ARTIGUES, RACHEL B. MARKS, EDITH L. NAGEL, FLORENCE POOLE, W. P. SIMON.

*Assistant Professors:* H. HOLLENBECK, MARJORIE W. MAIN, J. E. MCDONALD, D. KATHARINE ROGERS.

*Instructor:* MARY C. REESE.

*Lecturers:* J. BORUS, HELEN COYLE, MARY S. KUNST, VIRGINIA LEHMANN, J. B. RICHMOND.

### Courses for Undergraduates

**Minors:** Courses in social welfare administration may be counted toward a minor in the departments of Economics, Political Science, Psychology, and Sociology and Anthropology.

225. **Introduction to Social Work I.** Survey of the field of social work to 1900. Attention is given to the development of social services under both public and private auspices. Development of case work and the work of family welfare agencies to 1929. Modern public welfare programs. I, II; 3 to 4. (Students planning a career in social work, or those using this course for a minor, should register for four hours. Additional hour, to be arranged, will include some agency speakers, field trips, and additional library work.) Prerequisite: Senior standing. ROGERS.

226. **Introduction to Social Work II.** Survey of the field of social work since 1900. Attention is given to the development of modern social work philosophy, the growth of the public social services, and programs for special groups. I, II; 3 to 4. (Students planning a career in social work, or those using this course for a minor, should register for four hours. Additional hour will include some agency speakers, field trips, and additional library work.) Prerequisite: Senior standing; Social Welfare Administration 225. ROGERS.

### Courses for Advanced Undergraduates and Graduates

311. **Introduction to Social Case Work.** This course for employed workers deals with the behavior and attitudes expressed by persons asking for assistance, the feelings thus engendered, and the effects of all of these on the contacts of social case workers with individuals and families. Attention will be given to case records selected from social case work practice in public assistance and other community agencies. I, II; 2 hours, or ½ unit.

# SOCIOLOGY AND ANTHROPOLOGY

*Professors:* J. W. Albig (Chairman of Department), E. T. Hiller (Emeritus), D. E. Lindstrom, D. R. Taft, F. W. Znaniecki (Emeritus).

*Associate Professors:* R. Dubin, J. E. Hulett, Jr., O. Lewis, J. C. McGregor, E. H. Shideler, B. F. Timmons.

*Assistant Professors:* E. A. Ahrens, R. Bierstedt, Margaret K. Chandler, R. Dewey, C. Folse, R. W. Janes, D. E. Wray.

*Instructors:* A. Boskoff (Visiting), T. C. Esselstyn, Ruth A. Hudson.

*Assistants:* R. E. Corley, G. P. Davis, J. F. Epstein, Mildred Flebbe, H. H. Frankel, Eleanor P. Godfrey, J. Hamburger, M. Kaplan, E. S. Lucy, B. E. Munson, J. C. Osoinach, J. P. Reed, R. E. Ries, R. H. Robbins, A. A. Sio, L. H. Stidley, J. S. Taylor.

## SOCIOLOGY

### Requirements for L.A.S. Students

**Major:** Twenty hours from any courses in the department and three hours from Philosophy 311 (preferably taken during the junior year). Sociology 104 and 105, the general education courses, will not be accepted for major credit.

**Minors:** Twenty hours from any one or two of the following subjects: anthropology, economics, history, law, philosophy, political science, psychology, and social welfare administration. At least eight hours must be taken in each subject, if two are chosen. The curriculum on international affairs will be accepted as a minor.

### Courses for Undergraduates

**100. Principles of Sociology.** I, II; 3. Prerequisite: Sophomore standing. Bierstedt, Corley, Dewey, Esselstyn, Frankel, Hulett, Janes, Kaplan, Munson, Osoinach, Reed, Ries, Robbins, Taylor, Shideler.

**104. Community and Society.** A two-semester general course introductory to sociology and anthropology. Open to freshmen and sophomores only. This course satisfies the general education requirement in the College of Liberal Arts and Sciences. Not acceptable toward a major. I; 4. Janes and others.

**105. Community and Society.** Continuation of Sociology 104. Open to freshmen and sophomores only. II; 4. Janes and others.

**110. Social Factors in Personality.** Nature of person and relation to institutions, social order, and development. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Ahrens.

**140. Social Control.** I, II; 2. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Albig.

### Courses for Advanced Undergraduates

**212. Culture Patterns and the Individual.** Relationships between institutional structure and culture patterns and the common drives, attitudes, and other adjustive mechanisms of the group members. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. Hulett.

**220. Marriage and the Family.** The family as a social institution; its origin, nature, development, and trends. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, and junior standing; or senior standing. Godfrey, Osoinach, Stidley, Timmons.

**221. Contemporary Society.** Basic character of modern life forms; underlying principles and efforts at reorientation. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; Sociology 243; junior standing. Ahrens.

225. **Racial and Cultural Minorities.** I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DEWEY.

230. **Poverty and Society.** Dependent classes; modern methods and policies in their treatment; historical perspectives. I; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. Sociology 110 and courses in history and economics are recommended. TIMMONS.

243. **Social Evolution.** Primitive and modern societal structures; origin and development of social institutions, processes of social change; problems of progress. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. AHRENS.

270. **Population and Human Ecology.** Population in relation to resources; concentration and dispersion of peoples; the internal organization of urban areas; theories and human ecology and current problems. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DUBIN.

271. **Sociology of the Region.** Regionalism in theory; concepts and factors conditioning the types of regions; regionalism in operation in its dominant forms. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DEWEY.

276. **Sociology of the City.** Study of urban structure and ecology, particularly in light of the planning movement and the urban populations; growth and development of urban communities. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DEWEY.

277. **Rural Sociology.** Same as Agricultural Economics 277. A study of the importance of rural life, its social problems and means of solution. The importance of a scientific study of these factors, concentrating primarily on the social aspects of physical conditions, population, occupations, the family, the neighborhood, community organizations, the church, the school, the library, adult education, local government, recreation, country life movements, and possible future trends affecting rural life. I, II; 3. Prerequisite: Junior standing. LINDSTROM.

281. **Contemporary Sociology.** Contemporary sociological theories, with emphasis upon American writers. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; senior standing; major in sociology, or consent of instructor. BIERSTEDT.

288. **European Sociological Thought.** Historical evolution of objective; methodical investigation of social reality. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing.

290. **Honors Course.** Individual study or research projects. I; 2. Prerequisite: Senior standing. STAFF.

291. **Honors Course.** Individual study or research projects. II; 2. Prerequisite: Senior standing. STAFF.

## Courses for Advanced Undergraduates and Graduates

315. **Sociology of Education.** Same as Education 315. Objective comparative study of education as a social process in various cultures and historical periods, with main emphasis on present education in countries which share Western civilization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. SHIDELER.

318. **Human Relations in Industry.** Same as Labor and Industrial Relations 318. Sociology of industry and problems of personal adjustment. The emergence of modern industrial and labor organizations and their impact upon community life. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Psychology 100; Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, or consent of instructor. No credit toward graduation for both Sociology 318 and Engineering 230. CHANDLER, DUBIN, WRAY.

320. **Social Roles.** Comparative study of organized participation of individuals in social life and culture. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152.

324. **Penology.** Probation; parole; methods of institutional treatment. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 331. TAFT.

327. **National Culture Societies.** A comparative sociological survey of the formation, social organization, and interaction of modern nationalities as cultural groups. I or II; 3 hours, or ½ unit.

331. **Criminology.** Crime from the point of view of personality and social situations. I, II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Open to prelegal juniors by consent of instructor. TAFT.

332. **Prevention and Treatment of Juvenile Delinquency.** I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or 331, or Division of General Studies 151 and 152. ESSELSTYN.

340. **Social Movements.** Analysis of the factors in the formation and dynamics of social movements as collective behavior; patterns of growth, types of leaders, control mechanisms. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105.

344. **Public Opinion.** Opinion changes and control; propaganda; interest groups and opinion; critical review of methods of measurement. I, II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. ALBIG.

347. **Sociology of International Conflict.** War as a social process. Conflict of national cultures, population pressures, race relations, immigration policies, restrictions on communication and other elements in the international conflict process. Occupation policies in Germany and Japan. Implications of social science for changes in the process. II; 3 hours, or ½ unit. Prerequisite: Senior standing; Sociology 327 recommended. TAFT.

375. **Sociology of the Community.** Nature, structure, and functions of the community. Types of communities and examples of some better community studies. The relation of the community to the larger social organization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, and senior standing; or eleven hours of sociology. TIMMONS.

378. **Acculturation in Modern Society.** II; 3 hours, or ½ unit. Prerequisite: Five hours of sociology. JANES.

385. **Methods of Sociological Research.** I, II; 3 hours, or ½ unit. Prerequisite: Eight hours of sociology. BIERSTEDT.

## ANTHROPOLOGY

### Course for Undergraduates

107. **Introduction to Anthropology.** An introduction to general anthropology covering human origins and early man; race and racism, archaeology and the beginnings of human civilization, linguistics, and the nature of culture with examples from primitive societies. I, II; 3. Prerequisite: Sophomore standing. LEWIS, MCGREGOR.

### Courses for Advanced Undergraduates

251. **Archaeology: New World Prehistory.** A survey of the archaeology of the new world, with brief characterization of the various cultures, familiarity with basic literature of each area, and a summary evaluation of the interrelationships of these cultures. A lecture course supplemented with individual outside reading. I, II; 3. Prerequisite: Anthropology 107, or Sociology 104. MCGREGOR.

252. **Old World Archaeology.** A review of the prehistory of the Old World, including Europe proper, north Africa, and as far east as western India. A survey from the

earliest known times to the period of earliest written history. I; 3. Prerequisite: Anthropology 107, Sociology 104, or consent of instructor. McGregor.

260. **Primitive Society—Introduction to Ethnology.** An introduction to comparative ethnography. Its purpose is to indicate the range and diversity in the social, economic, political, and religious institutions of primitive peoples in various parts of the world. II; 3. Prerequisite: Anthropology 107, or Sociology 104. Lewis.

## Courses for Advanced Undergraduates and Graduates

353. **Southwestern Archaeology.** This course is a detailed study of one archaeological unit in the United States. It covers the three broad cultures with regional variations considered chronologically and stressing interrelationships of the various cultures. I or II; 3 hours, or ½ unit. Prerequisite: Anthropology 107. McGregor.

354. **Field Techniques in Archaeology.** Participation in archaeological excavation; techniques, methods, and procedures discussed and practiced in actual working conditions. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; registration in Anthropology 355; consent of instructor. McGregor.

355. **Laboratory Techniques and Problems in Archaeology.** Laboratory work in the field, studying, evaluating, and writing final report on preceding field work. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; consent of instructor. McGregor.

356. **Physical Anthropology.** The aims and methods of physical anthropology; both osteology and somatology, with emphasis on the human skeleton. II; 3 hours, or 1 unit. Prerequisite: Anthropology 107, or Sociology 104, or a course in anatomy or comparative anatomy, or a course in introductory zoology with consent of instructor. Offered in alternate years. McGregor.

361. **Ethnology of Middle America.** A survey of the peoples and cultures of Middle America with special emphasis upon Mexico and Guatemala. The course begins by placing Middle America geographically, historically, and culturally with the broader Latin American scene. The countries are first viewed as a whole and then selected ethnographic studies of specific communities are considered for comparitive purposes. The Caribbean will not be studied in this course. I or II; 3. Prerequsite: Anthropology 107, or registration in Latin American curriculum. Lewis.

363. **Religion in Primitive Society.** An introduction to the study of magic and religion in non-literate societies; the course will consider theories of the origin and function of magic and religion and an analysis of magic and religion in representative primitive societies. II; 3 hours, or 1 unit. Prerequisite: Anthropology 107 or Sociology 104. Offered in alternate years. Lewis.

364. **Field Work in Cultural Anthropology.** Supervised participation in field research; technique and procedures discussed and practiced under actual working conditions. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; speaking knowledge of the language of the area concerned; concurrent registration in Anthropology 365; consent of instructor. Lewis.

365. **Analysis of Field Data in Cultural Anthropology.** Evaluation, organization, and write-up of field data. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; speaking knowledge of the language of the area concerned; consent of instructor. Lewis.

# SPANISH AND ITALIAN

## (Including Portuguese)

*Professors:* J. Van Horne (Head of Department), A. Hamilton, H. R. Kahane.

*Associate Professor:* R. P. Oliver.

*Assistant Professors:* J. H. D. Allen, J. S. Flores, Angelina R. Pietrangeli.

*Instructors:* N. C. Giddings, S. L. Murphy, Albertine W. Osgood, H. P. Reeves, Concepción Zardoya.

*Assistants:* Q. Achuff, S. B. Adams, A. Aguirre, Raquel Andrade, R. Beym, W. Borenstein, Virginia K. Clutter, J. Darden, Ruth L. Fosnaugh, Dorothy J. Gengler, Carmen Iglesias, W. W. Kirk, H. D. Landrum, Carmen Manzanares, J. G. Markley, Trinidad Martínez, Lois H. Matthews, Frances C. McElhiney, Gladys Miranda, R. W. Norton, P. R. Olson, Lena Perri, R. W. Price, Nair P. Regier, Barbara B. Saloom, Nilza C. Santos, S. Saporta, Haydée Scheinin, J. G. Smalley, María I. Suffet, H. R. Sutherland, Verna K. Townsend, A. Triolo, J. L. Urla, Jacqueline Weaver.

## SPANISH

### Requirements for L.A.S. Students

**Major:** Twenty hours of Spanish, excluding Spanish 101, 102, 103, 113, and 114, and including at least five hours from the group for advanced undergraduates and graduates. Humanities 301, Introduction to Linguistics, may be counted toward the major in Spanish. Either Social Science 101 or 102, Latin American Civilization, may be counted toward the major in Spanish and is required for teacher-training majors in Spanish.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: education, English (excluding Rhetoric 101 and 102), French, German, Greek, history, Italian, Latin, Latin American studies, medieval civilization studies, philosophy, Portuguese.

### Courses for Undergraduates

**101. Elementary Spanish.** For students who have no credit in Spanish. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for Spanish 101 without 102. Prospective teachers are advised to register in special sections in spoken Spanish. Murphy, Van Horne, and others.

**102. Elementary Spanish.** Continuation of Spanish 101. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Spanish 101, or one year of high school Spanish. Prospective teachers are advised to register in special sections in spoken Spanish. Murphy, Van Horne, and others.

**103. Intermediate Spanish.** Rapid reading, review of grammar, composition, conversation. I, II; 4. Prerequisite: Spanish 102, or two years of high school Spanish. Murphy, Van Horne, and others.

**104. Intermediate Spanish.** Continuation of Spanish 103. I, II; 4. Prerequisite: Spanish 103, or three years of high school Spanish. Murphy, Van Horne, and others.

**113. Elementary Composition and Conversation.** May be taken concurrently with Spanish 103. Does not count toward the major in Spanish. I, II; 2. Prerequisite: Spanish 102, or two years of high school Spanish. Reeves and others.

**114. Elementary Composition and Conversation.** May be taken concurrently with Spanish 104. Does not count toward the major in Spanish. I, II; 2. Prerequisite: Spanish 113, or equivalent. Reeves and others.

## Courses for Advanced Undergraduates

201. **Introduction to Spanish Literature.** Reading of modern authors of Spain and Spanish America. I, II; 3. Prerequisite: Spanish 104, or four years of high school Spanish; junior standing, or consent of instructor. OSGOOD, ZARDOYA.

202. **Introduction to Spanish Literature.** Reading of modern authors of Spain and Spanish America. I, II; 3. Prerequisite: Spanish 201; junior standing, or consent of instructor. OSGOOD, ZARDOYA.

211. **Intermediate Composition and Conversation.** Required for teacher-training majors in Spanish. I, II; 3. Prerequisite: Spanish 104, or four years of high school Spanish. FLORES and others.

212. **Intermediate Composition and Conversation.** Required for teacher-training majors in Spanish. I, II; 3. Prerequisite: Spanish 211, or equivalent. FLORES and others.

213. **Advanced Composition and Conversation.** I; 3. Prerequisite: Spanish 212, or equivalent. FLORES and others.

214. **Advanced Composition and Conversation.** II; 3. Prerequisite: Spanish 213, or equivalent. FLORES and others.

215. **Spoken Spanish.** Intensive course. Exclusively oral-aural. Required for all teacher-training majors in Spanish. I, II; 4. Prerequisite: Senior standing; Spanish 212. SCHEININ, URLA, ZARDOYA.

231. **Commercial Spanish.** I; 2. Prerequisite: Spanish 104, or four years of high school Spanish. FOSNAUGH, SAPORTA.

232. **Commercial Spanish.** II; 2. Prerequisite: Spanish 231. FOSNAUGH, SAPORTA.

280. **Teachers' Course.** I; 2. Required for teacher-training majors in Spanish. Prerequisite: Spanish 201 and 202, or 211 and 212. OSGOOD.

291. **Senior Thesis.** For candidates for honors in Spanish. I; 2. STAFF.

292. **Senior Thesis.** For candidates for honors in Spanish. II; 2. STAFF.

## Courses for Advanced Undergraduates and Graduates

301. **Survey of Spanish Literature.** I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. FLORES.

302. **Survey of Spanish Literature.** II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. FLORES.

303. **Survey of Latin American Literature.** I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. VAN HORNE.

304. **Survey of Latin American Literature.** II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. VAN HORNE.

311. **Cervantes: Don Quixote.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1951-1952 and in alternate years.

312. **Cervantes: Don Quixote.** II; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1951-1952 and in alternate years.

313. **Classical Spanish Drama.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. OLIVER.

314. **Classical Spanish Drama.** II; 2 hours, or ½ unit. Prerequisite Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. OLIVER.

321. **Modern Spanish and Spanish American Drama.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. PIETRANGELI.

322. **Modern Spanish and Spanish American Drama.** II; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. PIETRANGELI.

323. **Modern Spanish and Spanish American Novel.** Nineteenth and twentieth century novels of Spain. I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. HAMILTON.

324. **Modern Spanish and Spanish American Novel.** Nineteenth and twentieth century novels of Spanish America. II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. HAMILTON.

325. **Lyric Poetry.** Spanish and Spanish American lyrics. I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. ALLEN.

326. **Lyric Poetry.** Spanish and Spanish American lyrics. II; 2 hours, or ½ unit. Prerequisite: Spanish 325. Offered in 1952-1953 and in alternate years. ALLEN.

331. **La Cultura Hispánica: España.** In Spanish. Required for teacher-training majors in Spanish. I; 2 hours, or ½ unit. ZARDOYA.

332. **La Cultura Hispánica: America Hispaña.** In Spanish. II; 2 hours, or ½ unit. ZARDOYA.

351. **Phonetics.** I, II; 2 hours, or ½ unit. Required for teacher-training majors in Spanish. Prerequisite: Spanish 202, or equivalent. FLORES, KAHANE.

352. **Syntax.** I, II; 2 hours, or ½ unit. Required for teacher-training majors in Spanish. Prerequisite: Spanish 202, or equivalent. KAHANE.

## ITALIAN

### Requirements for L.A.S. Students

**Major:** Twenty hours of Italian, excluding Italian 101 and 102, and including at least five hours from the group for advanced undergraduates and graduates. History 317 and 318, Humanities 301, and Italian 291 and 292 are acceptable. Italian 291 and 292 for majors can be arranged for advanced group credit.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: education, English (excluding Rhetoric 101 and 102), French, German, Greek, history, Latin, medieval civilization studies, philosophy, Portuguese, Spanish.

### Courses for Undergraduates

101. **Elementary Italian.** For students who have no credit in Italian. I; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for Italian 101 without Italian 102. OLSON, TRIOLO.

102. **Elementary Italian.** Continuation of Italian 101. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Italian 101, or one year of high school Italian. OLSON, TRIOLO.

103. **Intermediate Italian.** Rapid reading, review of grammar, composition, conversation. I; 4. Prerequisite: Italian 102, or two years of high school Italian. PIETRANGELI.

104. **Intermediate Italian.** Continuation of Italian 103. II; 4. Prerequisite: Italian 103, or three years of high school Italian. PIETRANGELI.

### Courses for Advanced Undergraduates

291. **Senior Thesis.** For candidates for honors in Italian. I; 2. STAFF.

292. **Senior Thesis.** For candidates for honors in Italian. II; 2. STAFF.

### Courses for Advanced Undergraduates and Graduates

311. **Dante: La Divina Commedia.** I; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. PIETRANGELI.

**312. Dante: La Divina Commedia.** Continuation of Italian 311. II; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. PIETRANGELI.

**321. Modern Italian Literature.** I; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. VAN HORNE.

**322. Modern Italian Literature.** II; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. VAN HORNE.

## PORTUGUESE

### Courses for Undergraduates

**101. Elementary Portuguese.** For students who have no credit in Portuguese. No credit toward graduation is given for Portuguese 101 without Portuguese 102. I; 4. Students with 95 or more credit hours receive only 3 hours credit. ALLEN, SANTOS.

**102. Elementary Portuguese.** Continuation of Portuguese 101. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Portuguese 101. ALLEN, SANTOS.

**103. Intermediate Portuguese.** Rapid reading, review of grammar, composition, and conversation. I; 4. Prerequisite: Portuguese 102, or two years of high school Portuguese. ALLEN, SANTOS.

**104. Intermediate Portuguese.** Continuation of Portuguese 103. II; 4, Prerequisite: Portuguese 103, or three years of high school Portuguese. ALLEN, SANTOS.

### Courses for Advanced Undergraduates and Graduates

**301. Introduction to Brazilian Literature.** Survey of the contemporary Brazilian novel. I; 3 hours, or ½ unit. Prerequisite: Portuguese 101 and 102. Portuguese 103 and 104 are optional, but desirable. ALLEN.

**302. Introduction to Portuguese Literature.** Survey of the Golden Age of Portuguese. II; 3 hours, or ½ unit. Prerequisite: Portuguese 101 and 102. Portuguese 103 and 104 are optional, but desirable. ALLEN.

## SPEECH

*Professors:* K. R. WALLACE (Head of Department), G. FAIRBANKS, B. HEWITT, SEVERINA E. NELSON, W. M. PARRISH.

*Associate Professors:* E. T. CURRY, L. S. HULTZÉN, J. C. KELLY, R. MURPHY, C. H. SHATTUCK, W. SWANSON, K. A. WINDESHEIM.

*Assistant Professors:* K. W. BROADRICK, O. A. DIETER, H. E. GULLEY, MARIE K. HOCHMUTH, H. L. MUELLER, C. B. OWENS, J. W. SCOTT, G. J. WISCHNER.

*Instructors:* MARY H. ARBENZ, CLARA BEHRINGER, HAZEL F. BOTHWELL, K. BURNS, NAOMI W. HUNTER, IDA LEVINSON, PATRICIA MCILRATH, R. E. NADEAU, L. W. OLSON, MARIE O. SHERE, W. B. SMALLEY.

*Assistants:* P. RUTH ARNOLD, K. D. BAXTER, ROSEMARY BERNARD, M. R. BOGARD, JOAN BOPP, W. E. BROCKRIEDE, R. S. BRUBAKER, K. G. CRIDER, N. DONAHOE, W. H. DRAPER, RUBY L. DRAUGHON, R. D. GASPER, WILMA GRIMES, N. GUTTMAN, P. R. HANSON, A. S. HOUSE, F. M. HULL, E. JORDAN, CHARLOTTE KECK, D. S. KREMPEL, G. H. KURTZROCK, O. K. LARSON, NANCY MCKAIG, I. R. MERRILL, J. E. MCMULLEN, BARBARA MILGROM, J. MILLS, G. E. REDDICK, GENEVIEVE RICHARDSON, CAROL ROACH, D. G. SCHAAL, ELIZABETH M. SCHIEFERSTEIN, A. J. SORTINI, D. L. TORRENCE.

## Requirements for L.A.S. Students

**Major:** Twenty hours in speech in addition to speech 101, 105, 111. At least five of the twenty hours must be in courses numbered 300 or higher; Speech 301 must be included. In declaring a major in speech, the student may choose one of these areas for emphasis: general speech, public address, interpretation, theater, speech science, hearing disorders, speech correction. The student should report to 134 Lincoln Hall to be assigned an area adviser with whom he will confer concerning required and recommended courses.

**Minors:** Twenty hours chosen in consultation with the adviser in one or two of the following subjects: classics, economics, English, French, German, history, Italian, law, philosophy, physics, physiology, political science, psychology, sociology and anthropology, Spanish, zoology. Certain courses in architecture, art, music, or not more than eight hours from the following courses in physical education may be selected: Physical Education for Women 209, 210, 211, 212, 240, 241, 242, 243, 244, 245, 246; P.E.M. 203, 206, 208, 211, 221, 222, 223. A minor may consist of the program of studies in medieval civilization. If two subjects are selected for the minor at least eight hours must be taken in each. No language courses may satisfy the minor requirements if they are excluded from the majors of the language departments.

Two teacher-training curricula are offered in speech: one in speech correction (see Miss Nelson) and one in the teaching of speech (see Mr. Windesheim).

## Courses for Undergraduates

**101. Principles of Effective Speaking.** Preparation and presentation of short informative and persuasive speeches, with emphasis on the selection and organization of material, methods of securing interest and attention, and the elements of delivery. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: A passing grade in Rhetoric 101 placement examination, or a passing grade in Rhetoric 100. ARNOLD, BROADRICK, BROCKRIEDE, BURNS, CRIDER, DIETER, DRAPER, DRAUGHON, GASPER, LARSON, MCKAIG, MERRILL, MILLS, NADEAU, OLSON, OWENS, PARRISH, REDDICK, SCHAAL, SCHIEFERSTEIN, SORTINI, TORRENCE, WALLACE.

**105. Voice and Articulation.** A drill course for improving the use of the normal speaking voice. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Consent of instructor. ARBENZ, KELLY, MUELLER.

**107. Parliamentary Procedure.** Principles and practice of parliamentary procedure. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. MURPHY.

**111. Business and Professional Speaking.** Study, preparation, and presentation of the chief types of business speeches, with special attention to conferences, sales talks, interviews, job applications. I, II; 2. Prerequisite: Speech 101; sophomore standing. MILLS, OLSON, WINDESHEIM.

**117. Argumentation.** Methods of logical analysis; the kinds and forms of argument; the adaptation of argumentative materials to audience situations; and the forms of debate. Practice debates on current subjects. I, II; 3. Prerequisite: Speech 101; sophomore standing. BROADRICK, DIETER, GULLEY, MURPHY.

**141. Oral Interpretation.** Principles of interpretation, analysis, and oral reading of prose literature and verse. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. BERNARD, BOGARD, BURNS, GRIMES, HANSON, KREMPEL, MCILRATH, MCKAIG, MCMULLEN, MUELLER, PARRISH.

**157. Elements of Stagecraft.** The design of stage scenery; the materials and methods of scenery construction and stage lighting. Lectures, readings, and practical problems. I, II; 4. SCOTT.

**161. Fundamentals of Acting.** A study of the methods of acting, with emphasis given to basic stage techniques. The role of the character in relation to the play as a whole; the intellectual and emotional values of the play and their interpretation by means of voice and action. I, II; 3. Prerequisite: Speech 141. ARBENZ, BEHRINGER, DONAHOE, RICHARDSON.

164. **Radio Speaking.** Preparation and presentation of the chief types of radio speeches, and of the interview, round table, and discussion. Microphone experience. I, II; 2. Prerequisite: Consent of instructor. MERRILL.

## Courses for Advanced Undergraduates

203. **Dramatics for Teachers.** A survey of methods and procedures of play production in the secondary school. I; 3. RICHARDSON.

204. **Speech for Teachers.** A course designed for prospective teachers who are non-speech majors. A discussion of methods and materials available for teaching speech and directing extracurricular speech activities. II; 3. Prerequisite: Senior standing; consent of instructor. BURNS, MUELLER.

208. **Classroom Problems in Speech Correction.** Orientation of prospective teachers to speech needs of pupils in elementary grades. I, II; 3. Prerequisite: Junior standing. SHERE.

213. **Methods and Materials of Public Discussion.** Getting information and reaching decisions through procedures of democratic discussion. Practice in designing, participating in, and moderating patterns of discussion used in conference and forum with materials drawn from current public questions. I, II; 3. Prerequisite: Speech 101; junior standing. GULLEY, MURPHY.

218. **Advanced Argumentation.** An inclusive study of methods of controversy revealed in public questions and famous debates. Practice in arguing, examining, adjudicating. II; 3. Prerequisite: Speech 117; junior standing. MURPHY.

221. **Persuasion.** Study of the nature and methods of attention, suggestion, and motivation as applied to speechmaking for the influencing of group opinion and action. Preparation and presentation of short persuasive speeches. I, II; 3. Prerequisite: Speech 101; junior standing. HOCHMUTH, NADEAU, OWENS, WALLACE.

243. **Oral Interpretation of Shakespeare.** Analysis and oral presentation of selections from Shakespeare's plays. I; 2. Prerequisite: Speech 141; junior standing. ARBENZ.

247. **Teaching of Speech.** Same as Education 247. A study of methods and materials used in teaching speech in the high school. I, II; 5. Prerequisite: Senior standing; 3.5 grade average. BURNS.

255. **Play Directing.** An analysis of the director's duties; the basic elements of play structure as they relate to play directing; stage composition and movement; rhythm. I; 3. Prerequisite: Speech 161; junior standing. DONAHOE.

256. **Play Directing.** Principles and methods of choosing plays for production; organization of the production staff; casting; coaching actors; the techniques of planning and conducting rehearsals and performances. II; 3. Prerequisite: Speech 255. W. SWANSON.

261. **Advanced Acting.** The psychology of acting; methods of preparing a role; acting techniques for period plays. I, II; 3. Prerequisite: Speech 161; consent of instructor. ARBENZ, MCILRATH, SWANSON.

263. **Introduction to Playwriting.** Theory and practice of writing for the theater, with emphasis on basic techniques. Writing of scenes and one-act plays. I, II; 3. Prerequisite: Consent of instructor. SMALLEY.

264. **Radio Acting.** Same as Journalism 264. The technique and special problems of acting in radio. Lectures, demonstrations, and practical microphone experience, with the emphasis throughout on individual development in interpretation and characterization. I, II; 2. Prerequisite: Consent of instructor. RIDER.

291. **Thesis and Honors.** I; credit to be arranged. Open to seniors with a 4.0 average.

292. **Thesis and Honors.** II; credit to be arranged. Open to seniors with a 4.0 average.

## Courses for Advanced Undergraduates and Graduates

301. **Introduction to Phonetics.** Basic principles of phonetic study, including observation and representation of pronunciation; ear training; practice in transcription. I, II; 3 hours, or ½ to 1 unit. HULTZÉN, MUELLER, PARRISH.

311. **British Public Address.** Study of representative British speakers from the sixteenth century to the present. Lectures, reports, and papers. I; 3 hours, or ½ to 1 unit. Prerequisite: Speech 117 or 221. OWENS.

312. **American Public Address.** Study of representative American speeches from the sixteenth century to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 117 or 221. HOCHMUTH.

321. **Modern Rhetorical Theory, 1700 to 1890.** A consideration of the significant movements in the development of rhetorical theory in England, France, and America, from 1700 to 1890. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOCHMUTH.

322. **Modern Rhetorical Theory, 1890 to the Present.** A consideration of the significant movements in the development of rhetorical theory in England, France, and America, from 1890 to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOCHMUTH.

342. **Advanced Interpretation.** Oral interpretation of poetry. II; 3 hours, or ¼ to 1 unit. Prerequisite: Speech 141. PARRISH.

352. **Theories of Play Production.** Origins and development of modern theatrical production; a critical examination of contemporary ideas and practices in theater architecture, acting, directing, and staging. I; 3 hours, or ½ to 1 unit. HEWITT.

361. **History of the European Theater to the Renaissance.** The theater and the theater arts of ancient and of medieval Europe. I; 3 hours, or ¼ to 1 unit. SHATTUCK.

362. **History of the European Theater from the Renaissance to 1900.** The European theater and the theater arts from 1576 to 1900, with special reference to the English theater. II; 3 hours, or ½ to 1 unit. SHATTUCK.

363. **Advanced Play Writing.** Application of principles of dramatic form and structure to the more complex problems of playwriting. Practice in writing the full-length play. I, II; 3 hours, or ½ to 1 unit. (Course may be repeated for 3 hours.) Prerequisite: Speech 263; consent of instructor. SMALLEY.

366. **Development of the American Theater.** The development of the theater and of theater arts in America from colonial times to the beginning of the twentieth century. II; 3 hours, or ¼ to 1 unit. HEWITT.

371. **History and Principles of Literary and Rhetorical Criticism: Aristotle to Sidney.** Same as English 371. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

372. **History and Principles of Literary and Rhetorical Criticism: Sidney to the Present.** Same as English 372. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

373. **Phonetics and Phonemics.** Methodologies of phonetics, with special application to English; general principles of phonemic interpretation. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Speech 301. HULTZÉN.

375. **Speech Science.** Introduction to anatomical and physiological characteristics of the normal speech mechanism. Demonstration in speech laboratory. I; 3 hours, or ½ to 1 unit. Prerequisite: Ten hours of speech; senior standing, or consent of instructor. CURRY.

376. **Speech Science.** Introduction to the acoustical characteristics of voice and speech sounds and to the physiology of the ear. Demonstration in speech laboratory. II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 375. CURRY.

383. **Psychological Disorders of Speech.** Principles and methods of clinical and classroom correction of psychological disorders of speech, with special reference to stuttering

and delayed speech; clinical and classroom practice with children and adults. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; consent of instructor. WISCHNER.

385. **Speech Correction.** Study of the causes, symptoms, and treatment of speech disorders, including articulatory, vocal, and rhythmical disorders; observation and practice in clinical techniques are provided in laboratory. I; 4 hours, or ½ to 1 unit. Prerequisite: Ten hours of speech, or consent of instructor; senior standing. NELSON.

386. **Clinical Practice.** Case work and practice teaching in remedial speech. Must be taken concurrently with Speech 385. I; 1 to 3 hours, or ½ unit. NELSON and others.

387. **Voice and Articulation Disorders.** Principles and methods of clinical and classroom correction of voice and articulation disorders. I or II; 3 hours, or ½ unit. Prerequisite: Speech 385; consent of instructor. KELLY.

388. **Speech Correction.** Study of causes, symptoms, and treatment of speech disorders, including stuttering, cerebral palsy, aphasia, and glandular disorders. II; 4 hours, or ½ unit. Prerequisite: Speech 385. NELSON.

389. **Clinical Practice.** Case work and practice teaching in remedial speech. Must be taken concurrently with Speech 388. II; 1 to 3 hours, or ½ unit. NELSON and others.

391. **Introduction to Hearing Disorders.** Analysis of symptoms and causes of hearing losses; effects of hearing loss upon oral communication, education and psychological adjustment; principles of retraining the hard of hearing. I, II; 3 hours, or ¼ to ½ unit. Prerequisite: Ten hours of speech; Speech 301; junior standing, or consent of instructor. HOUSE.

393. **Aural Rehabilitation.** Principles and methods of clinical and classroom retraining of the hard of hearing, including lip reading, auditory training, speech correction and conservation, counseling. Clinical and classroom practice with children and adults. I, II; 3 hours, or ¼ to ½ unit. Prerequisite: Speech 391; senior standing, or consent of instructor. Required in the curriculum of teacher training in speech correction. ROACH.

395. **Audiometry and the Use of Hearing Aids.** Selective and diagnostic tests of hearing, the planning and conduct of hearing conservation programs, general problems involved in the use of hearing aids. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 376. HOUSE.

## THEORETICAL AND APPLIED MECHANICS

*Professors:* F. B. SEELY (Head of Department), W. L. COLLINS, T. J. DOLAN, J. O. DRAFFIN, M. L. ENGER (Emeritus), N. E. ENSIGN (Emeritus), H. L. LANGHAAR, W. M. LANSFORD, H. F. MOORE (Emeritus), N. O. MYKLESTAD, W. J. PUTNAM, H. J. SCHRADER, W. L. SCHWALBE, J. O. SMITH.

*Associate Professors:* W. E. BLACK, R. E. CRAMER, W. N. FINDLEY, P. G. JONES.

*Assistant Professors:* C. E. BOWMAN, R. L. BROWN, C. W. DOLLINS, H. M. FITCH, E. HOGNESTAD, R. S. JENSEN, C. E. KESLER, W. M. OWEN, O. M. SIDEBOTTOM, M. C. STEELE, M. C. STIPPES, H. R. WETENKAMP, W. J. WORLEY.

*Associates:* W. J. CRAIG, R. C. ELSTNER, R. S. JENSEN, C. K. LIU, G. M. SINCLAIR, I. VIEST.

*Research Adviser:* A. M. FREUDENTHAL.

*Instructors:* A. P. BORESI, D. R. CARVER, M. E. CLARK, H. T. CORTEN, T. M. ELSESSER, A. H. HAUSRATH, M. E. LUNCHICK, A. Q. MOWBRAY, K. S. PISTER, W. B. SANDERS, J. R. SNOWDEN, F. J. STANEK, C. E. TAYLOR, C. E. WORK.

*Assistants:* J. R. GASTON, W. D. JORDAN, R. W. KARRY, T. P. KERR, J. L. KRAHULA, J. J. POCZATEK, F. C. RALLY, D. D. STROHBECK, L. B. TAPLIN.

## Courses for Undergraduates

150. **Analytical Mechanics (Statics).** Resultants of force systems, algebraic and graphical conditions of equilibrium of force systems. Analysis of forces acting on members of trusses, frames, etc. Forces due to friction. Centroids. I, II; 2. Prerequisite: Registration in Mathematics 142. STAFF.

154. **Analytical Mechanics (Statics and Dynamics).** A combination of Theoretical and Applied Mechanics 150 and 211 with less emphasis on some topics. For electrical engineering students only. I, II; 1. Prerequisite: Registration in Mathematics 112. STAFF.

156. **Analytical Mechanics (Statics and Dynamics).** A combination of Theoretical and Applied Mechanics 150 and 211. I, II; 5. Prerequisite: Registration in Mathematics 112. STAFF.

171. **Elements of Mechanics.** Resultants and equilibrium of force systems; conditions of equilibrium applied to trusses, frames, etc.; forces due to friction, centroids; stress and deformation in direct tension and compression; riveted and welded joints; properties of materials. For architects only. I, II; 3. Prerequisite: Mathematics 122. DRAFFIN and others.

172. **Strength of Materials.** Relationships between external forces acting on beams and the stresses produced; shear moment, slope, and deflection diagrams; moment of inertia; columns. For architects only. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 171. DRAFFIN and others.

## Courses for Advanced Undergraduates

211. **Analytical Mechanics (Dynamics).** Displacement, velocity, and acceleration of a particle; relation between forces acting on rigid bodies and the changes in motion produced; translation; rotation; plane motion; solutions using the principles of force, mass and acceleration, work and energy, and impulse and momentum. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150. STAFF.

221. **Resistance of Materials.** Relationships between external forces acting on elastic bodies and the stresses and deformations produced; tension and compression members; members subjected to torsion and to bending; columns; combined stresses; properties of materials. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150, 151, or 156. STAFF.

223. **Resistance of Materials Laboratory.** Tests of steel, cast iron, aluminum alloys, concrete and wood; determination of such mechanical properties as strength, hardness, ductility, energy resistance; engineering significance of mechanical properties. I, II; 1. Prerequisite: Registration in Theoretical and Applied Mechanics 221. STAFF.

232. **Fluid Mechanics.** Analysis of flow of fluids in pipes and in open channels. Bernoulli's theorem; viscosity, laminar and turbulent flow; effects of jets on vanes; hydraulic similitude; dimensional analysis; Reynolds' and Froude's numbers. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 211. LANSFORD and others.

234. **Laboratory in Fluid Mechanics.** Measurement of pressure and quantity of flow; venturi and nozzle meters; cavitation; viscosimetry; laminar and turbulent flow of water and oil in smooth and rough pipes; flow in open channels; weirs and orifices; pumps and turbines. I, II; 1. Prerequisite: Registration in Theoretical and Applied Mechanics 232. LANSFORD and others.

297. **Thesis.** I; 3. Prerequisite: Senior standing; approval of head of department. STAFF.

298. **Thesis.** Continuation of Theoretical and Applied Mechanics 297. II; 3. Prerequisite: Senior standing; approval of head of department. STAFF.

## Courses for Advanced Undergraduates and Graduates

311. **Mechanical Vibrations.** Kinematics of vibratory motion. Comprehensive study of motion having single degree of freedom. Critical speeds of shafts; vibration of systems with several degrees of freedom. Applications to engineering problems.

I; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 154 or 156, or 211 and 221. JONES, MYKELSTAD.

321. **Advanced Mechanics of Materials.** Methods used in elementary mechanics of materials are expanded and generalized and used to solve more complex problems. Thick-walled cylinders, torsion of bar having non-circular cross-section; curved beams, unsymmetrical bending, flat plates; theories of failure. I; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 221 or 223. BLACK, SMITH.

323. **Advanced Laboratory in Materials Testing.** Calibration of testing machines and of strain measuring instruments. Use of various mechanical and electrical strain gauges. Interpretation of tests results. Relation of tests to specifications of materials. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 221 and 223. COLLINS, PUTNAM.

326. **Experimental Stress Analysis.** Measurement of stresses or deformations that are of significance in the engineering design of load resisting members. Use of optical, electrical, and mechanical instrumentation, models, analogies, brittle coatings, electrical resistance gauges, photoelasticity, etc. II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 150, 211, 221, and 223 (321 desirable). DOLAN.

334. **Fluid Mechanics and Advanced Hydraulics.** A study of the basic properties of fluids in general, particularly those that influence the flow of fluids in pipes and open channels, viscosimetry, dimensional analysis, effect of boundary conditions, cavitation, water tunnel, hydraulic jump, water hammer, pumps, turbines. Some laboratory work. II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 232 and 234. LANSFORD.

# VETERINARY MEDICINE

## (Including Veterinary Anatomy and Histology, Veterinary Clinical Medicine, Veterinary Pathology and Hygiene, and Veterinary Physiology and Pharmacology)

Three types of courses are offered by the College of Veterinary Medicine: (1) courses for undergraduates, designed as service courses for students in the College of Agriculture; (2) professional courses, which are part of the curriculum in veterinary medicine; and (3) courses for graduates.

# VETERINARY ANATOMY AND HISTOLOGY

*Professor:* L. E. ST. CLAIR (Head of Department).
*Assistant Professor:* M. S. COVER.
*Instructor:* G. A. LINTON.
*Assistant:* ELIZABETH J. REEVES.
*Medical Illustrator:* C. R. HELDT.

### Course for Undergraduates

101. **Anatomy of Domestic Animals.** A study of the structure of cells, tissues, organs, and systems of domestic animals. For students in agriculture. Lectures and demonstrations. I; 3. Prerequisite: Sophomore standing. ST. CLAIR and assistant.

### Professional Courses

411. **Gross Anatomy.** Systematic and topographic study and dissection of the dog. Lectures, discussions, demonstrations, quizzes, and laboratory. I; 5 Prerequisite: Registration in the veterinary curriculum, or consent of instructor. ST. CLAIR and assistant.

312. **Gross Anatomy.** Comparative study and dissection of domestic animals with special reference to development and adaptation to function. Lectures, discussions, demonstrations, quizzes, and laboratory. II; 5. Prerequisite: Veterinary Anatomy 311, or consent of instructor. ST. CLAIR and assistant.

313. **Histology and Embryology.** Structure and development of cells and tissues with special reference to domestic animals. Lectures, discussions, demonstrations, quizzes, and laboratory. I; 5. Prerequisite: Registration in the veterinary curriculum, or consent of instructor. COVER and assistant.

314. **Histology and Embryology.** Structure and development of organs and systems with comparison in different domestic animals. Lectures, discussions, demonstrations, quizzes, and laboratory. II; 5. Prerequisite: Veterinary Anatomy 313, or consent of instructor. COVER and assistant.

## VETERINARY CLINICAL MEDICINE

*Professor:* L. E. BOLEY (Head of Department).
*Associate Professor:* R. D. HATCH.
*Assistant Professors:* H. J. HARDENBROOK, R. E. WITTER.
*Instructors:* T. H. BRASMER, P. J. MEGINNIS.

### Professional Courses

331. **Diseases of Small Animals.** Diagnosis, treatment, and prophylaxis of infectious, noninfectious, and surgical diseases of small domestic animals. I; 5. Prerequisite: Third-year standing in veterinary curriculum. WITTER.

333. **Breeding Problems and Obstetrics.** General principles of obstetrics and discussion of the breeding diseases of farm animals. Lectures, discussions, and laboratory. I; 5. Prerequisite: Third-year standing in veterinary curriculum. BOLEY.

334. **Diseases of Large Animals.** Diagnosis, treatment, and prevention of non-infectious, nutritional, metabolic, toxic, and parasitic diseases of large animals. Lectures and discussions. II; 5. Prerequisite: Third-year standing in veterinary curriculum. HATCH.

335. **General Surgery.** General surgical principles and procedures, including restraint, anesthesia, equipment, and all phases of tissue injury and repair. I; 3. Prerequisite: Third-year standing in veterinary curriculum. HARDENBROOK, MEGINNIS.

336. **Special Surgery.** Lectures and clinical demonstrations on surgical diseases, their diagnosis, operative procedure, and after care. II; 5. Prerequisite: Third-year standing in veterinary curriculum. HARDENBROOK, MEGINNIS.

337. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis treatment, and prophylaxis of animal diseases. I; 2. Prerequisite: Third-year standing in veterinary curriculum. BOLEY and staff.

338. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. II; 2. Prerequisite: Third-year standing in veterinary curriculum. BOLEY and staff.

340. **Jurisprudence, Business Methods, and Ethics.** Same as Management 340. Principles of law, business procedures, and professional ethics of importance to members of the veterinary profession; animal diseases and related regulatory laws and their administration; federal procedure under animal disease and food and meat inspection laws. II; 3. Prerequisite: Senior standing in veterinary curriculum.

341. **Infectious Diseases of Large Animals.** Diagnosis, treatment, and prophylaxis of the infectious diseases of large animals. Lectures, discussions, and quizzes. I; 5. Prerequisite: Fourth-year standing in veterinary curriculum. HATCH.

343. **Radiology.** General principles of radiology including technique and its application to the diagnosis and therapy of animal diseases. Lectures and discussion. I; 1. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. HARDENBROOK.

345. **Seminar.** Assigned reading and discussion of cases presented for diagnosis and treatment. I; 1. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

346. **Seminar.** Assigned reading and discussion of cases presented for diagnosis and treatment. II; 1. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

347. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. I; 8. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

348. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. II; 8. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

## VETERINARY PATHOLOGY AND HYGIENE

*Professors:* R. GRAHAM (Head of Department), C. C. MORRILL.

*Associate Professors:* J. O. ALBERTS, N. D. LEVINE, ETHEL MCNEIL.

*Assistant Professors:* P. D. BEAMER, H. S. BRYAN, O. D. GRACE, M. E. MANSFIELD, H. E. RHOADES, G. T. WOODS.

*Instructors:* P. B. BARTO, EMILY L. DORSTEWITZ, L. E. HANSON, D. W. PRATT, S. C. SCHMITTLE, F. H. WHITE.

*Assistants:* G. BISWAL, VIRGINIA IVENS, D. MAKSIC.

*Medical Illustrator:* C. R. HELDT.

### Courses for Undergraduates

105. **Animal Hygiene.** Contagious, infectious, parasitic, nutritional, and metabolic diseases of animals; their relation to agriculture and public health and their prevention. Lectures. Recommended for students in animal, dairy, and poultry husbandry. I; 3. Prerequisite: Sophomore standing. BARTO, BOLEY, HARDENBROOK.

### Professional Courses

323. **Bacteriology and Immunology.** The bacteriology and immunology of diseases of domestic and wild animals caused by bacteria, fungi, rickettsiae, and filterable viruses. Lectures, quizzes, and laboratory. I; 5. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. BRYAN and assistant.

324. **Parasitology.** Protozoa, helminths, arthropods, and other parasites affecting dometic animals. Lectures, discussions, and laboratory. II; 5. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. LEVINE and assistant.

325. **General Pathology.** The basic principles of pathological processes including tissue injury and repair, circulatory and metabolic disturbances, inflammation and neoplasia. Lectures, quizzes, demonstrations, and laboratory. I; 5. Prerequisite: Second-year standing in the veterinary curriculum, or consent of instructor. MORRILL and assistant.

326. **Special Pathology.** Disease processes affecting organs and anatomic systems and those occurring in specific diseases. Lectures, quizzes, demonstrations, and laboratory. II; 5. Prerequisite: Second-year standing in the veterinary curriculum, or consent of instructor. MORRILL and assistant.

332. **Principles of Sanitation in the Processing and Handling of Foods.** Same as Food Technology 332. A study of the principles of sanitation with appropriate emphasis on practical considerations as they apply to various food processing industries. Control of insects, rodents, and microorganisms; fundamentals of detergency; sanitation of water supplies; waste disposal methods. Government and public health regulations. Local field trips to food processing plants. II; 4. Prerequisite: Bacteriology 104, 105, and Chemistry 132, or equivalents. ORDAL.

344. **Food Hygiene and Public Health.** General principles of antemortem inspection of food animals; the procedures and techniques used in the inspection of food of animal origin for type, class, and grade; diseases of animals transmissible to man. II; 5. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. II; 5. HARDENBROOK, MEGINNIS, TEIGLER.

349. **Diseases of Poultry.** The causes, symptoms, lesions, prevention, and treatment of non-infectious and infectious diseases of domestic birds. Lectures, quizzes, and demonstrations. I; 3. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. ALBERTS.

## VETERINARY PHYSIOLOGY AND PHARMACOLOGY

*Professor:* J. SAMPSON (Head of Department).
*Assistant Professor:* R. P. LINK.
*Instructors:* REBECCA K. BORTON, T. R. HOUPT.

### Course for Undergraduates

102. **Physiology of Domestic Animals.** Lectures and recitations or demonstration. II; 3. Prerequisite: Chemistry 101, or equivalent; sophomore standing. Veterinary Anatomy 101 is recommended. LINK, SAMPSON.

### Professional Courses

321. **Physiology.** Blood and lymph, circulation, respiration, digestion and absorption excretion. Lectures, quizzes, demonstrations, and laboratory. I; 4. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. SAMPSON and assistant.

322. **Physiology.** Metabolism, heat production, endocrine organs, muscle and nerve, central nervous system, special senses, reproduction. Lectures, quizzes, demonstrations and laboratory. II; 4. Prerequisite: Second-year standing in the veterinary curriculum, or consent of instructor. SAMPSON and assistant.

329. **Pharmacology.** General principles of pharmacy and an analysis of the action of chemical agents on physiological processes. Lectures and discussion. II; 3. Prerequisite: Second-year standing in the veterinary curriculum, or consent of instructor LINK.

330. **Pharmacology.** Principles of drug action and an analysis of the action of chemical agents on living organisms. Lectures and laboratory. I; 4. Prerequisite: Veterinary Physiology and Pharmacology 329, or consent of instructor. LINK.

## ZOOLOGY

*Professors:* F. B. ADAMSTONE (Head of Department), L. A. ADAMS (Emeritus), C. G. HARTMAN (Emeritus), S. C. KENDEIGH, R. R. KUDO, V. E. SHELFORD (Emeritus), L. J. THOMAS, H. J. VAN CLEAVE.

*Associate Professors:* B. V. Hall, L. Ingle, O. E. Kugler, W. M. Luce, S. M. Rose, H. M. Smith.

*Assistant Professors:* H. I. Fisher, D. F. Hoffmeister, M. R. Matteson, H. H. Shoemaker.

*Instructors:* J. B. Kitzmiller, F. J. Kruidenier.

*Assistants:* B. Berne, G. A. Braun, G. Brody, N. R. Cooley, C. F. Ellerman, G. Garoian, J. H. Gilford, J. S. Greenstein, E. J. Hugghins, D. A. James, Sarah A. Joyner, T. King, A. Kurland, J. C. List, L. S. Miller, R. E. Nelson, R. E. Ogren, Mabel C. Paterson, K. A. Rafferty, Jr., M. Sacks, D. Shomay, J. D. Tiner, R. Torch, K. S. Tweedell, R. G. Van Gelder.

## Requirements for L.A.S. Students

**Major:** Twenty hours in zoology excluding Zoology 101, 104, 107, and Biological Sciences 100, and including five hours of advanced work. Entomology 313 may be applied for major credit.

**Minors:** Twenty hours chosen from one or two of the following subjects: animal science, bacteriology, botany, chemistry, education, entomology, geography, geology, mathematics, physics, physiology, psychology. At least eight hours must be taken in each subject, if two are chosen.

Note: Division of General Studies 131 and 132 may be substituted for Zoology 101 or 104 wherever the latter two constitute a prerequisite.

## Courses for Undergraduates

101. **General Zoology.** Animal biology; structure, function, environmental relations, origin, and development of animals. This course is designed for zoology majors and to satisfy part of the requirements for premedical students. Lectures, laboratory, and quiz. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Fisher, Kitzmiller, Luce, Thomas.

104. **General Zoology.** Fundamental principles of the structure, physiology, reproduction, ecology, and evolution of animals, with special emphasis on their relations to human life. This course and Botany 100 meets the general education biological requirement in the College of Liberal Arts and Sciences and the zoology requirement for students in agriculture. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Ingle.

107. **Evolution.** Analysis of the theories of evolution, the mechanism of evolutionary changes, and the evolution of man. I; 3. Prerequisite: Sophomore standing. Kitzmiller.

132. **Comparative Vertebrate Anatomy.** Classification and distribution of the vertebrate animals. Comparative anatomy of organs and organ systems, their function and evolution. Lectures, laboratory, and quiz. I, II; 5. Prerequisite: Zoology 101, or one year of general biology such as biological sciences or botany-zoology sequence. A grade of "C" in Zoology 101 is required for freshmen. Hall, Shoemaker, Smith.

## Course for Advanced Undergraduates

140. **Introduction to Ecology.** Seasonal and climatic relations of species and communities. II; 3 to 4. Prerequisite: Zoology 101, or equivalent; junior standing. Shoemaker.

## Courses for Advanced Undergraduates and Graduates

300. **General Seminar.** For members of the staff and graduate students. Also open to seniors whose major is zoology. I; no credit. Attention is called to the following special clubs and seminars, some of which are interdepartmental: Animal Ecology Club, Genetics Seminar. Staff.

**301. General Seminar.** For members of the staff and graduate students. Also open to seniors whose major is zoology. II; no credit. Attention is called to the following special clubs and seminars, some of which are interdepartmental: Animal Ecology Club, Genetics Seminar. STAFF.

**302. Individual Topics.** For those who wish to study individual problems. Candidates for honors and undergraduates who are enrolled for tutorial work or in individual curricula should register in this course. Graduates may register for topics involving individual work not assigned in other courses. Laboratory, conferences, and readings. I; 2 to 5 hours, or ½ to 1 unit. Prerequisite: Two years of zoology; senior standing; approval of department. STAFF.

**303. Individual Topics.** For those who wish to study individual problems. Candidates for honors and undergraduates who are enrolled for tutorial work or in individual curricula should register in this course. Graduates may register for topics involving individual work not assigned in other courses. Laboratory, conferences, and readings. II; 2 to 5 hours, or ½ to 1 unit. Prerequisite: Two years of zoology; senior standing; approval of department. STAFF.

**304. Field Zoology.** Collection, preservation, and identification of lower vertebrates and land and fresh water invertebrates; habits and life histories of selected forms. I; 5 hours, or 1 unit. Prerequisite: One year of zoology, or equivalent; senior standing. MATTESON.

**306. Biology for Teachers.** Same as Botany 306. A teacher-training and review course for those engaged in or preparing for teaching general biology in high school. II; 2 hours, or ¼ or ½ unit. Prerequisite: Botany 100; Zoology 101. FULLER, MATTESON.

**318. Protozoology.** Morphology, taxonomy, physiology, and life history of representative free-living and parasitic protozoa. I, II; 5 hours, or 1 unit. Prerequisite: One year of zoology, or equivalent; senior standing. KUDO.

**320. Invertebrate Zoology.** Invertebrates: structure and development. Application of biological principles. Specific and comparative morphology of the invertebrates; coordination of structure and function, origin, development, and life histories. II; 4 hours, or 1 unit. Prerequisite: Zoology 101. INGLE.

**321. Parasitology-Helminthology.** Worm parasites, life cycles, morphology, taxonomy, environmental relations. Lecture, laboratory, technic, readings, quiz, demonstrations, problems. I, II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Zoology 132; senior standing. THOMAS.

**332. Advanced Vertebrate Zoology.** Vertebrate morphology; comparative anatomy, evolution, and function of vertebrate organ systems, with special emphasis on the evolution, anatomy, and function of the skeletal and nervous systems. Lectures and laboratory. I; 4 hours, or 1 unit. Prerequisite: Zoology 333. Offered in 1952-1953 and in alternate years. HALL.

**333. Vertebrate Embryology.** The development of the vertebrate body and its organs. I, II; 5 hours, or 1 unit. Prerequisite: Zoology 132. ADAMSTONE, KRUIDENIER.

**334. Vertebrate Histology.** Study and preparation of tissues of the vertebrate body. II; 3 hours, or ½ unit. Prerequisite: Zoology 333; junior standing, or consent of instructor. ADAMSTONE.

**335. Ornithology.** Structure, functions, environmental relations, habits, life history, and identification of birds. II; 3 hours, or ½ unit. Prerequisite: Zoology 101 or 104. FISHER, KENDEIGH.

**336. Mammalogy.** Classification, distribution, life history, evolution, and identification of mammals. Lecture, laboratory, and field work. I; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1951-1952 and in alternate years. HOFFMEISTER.

**337. Ichthyology.** Classification, structure, evolution, distribution, and life history of fishes. Lectures, laboratory, and field work. I; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1952-1953 and in alternate years. SHOEMAKER.

338. **Herpetology.** Classification, distribution, life history, and identification of reptiles and amphibia, particularly those of the United States. Lectures, laboratory, and field work. II; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1951-1952 and in alternate years. SMITH.

341. **Field Ecology.** Study of biotic communities, birds and fish in the vicinity of Reelfoot Lake, Tennessee, covering six days. Students may enroll in subsequent years for additional credit by specializing in different fields of study. II; 1 to 4 hours, or ¼ to 1 unit. Prerequisite: Registration in Zoology 240, or 335, or equivalent. KENDEIGH, SHOEMAKER.

342. **Wildlife Management and Conservation.** Size and measurement of animal population, factors affecting reproduction and mortality, life history, management policies for fishes, mammals, and birds, I; 3 hours, or ½ unit. Prerequisite: Zoology 101 or 104. SHOEMAKER.

343. **Limnology.** Study of the lake, pond, and river with emphasis on the physical environment as well as on the plants and animals which live in fresh water. Lectures, discussions, laboratory, and field work. II; 3 hours, or ½ unit. Prerequisite: Zoology 101, or Botany 100. Offered in 1952-1953 and in alternate years. MATTESON.

345. **Animal Ecology and Geography.** Dynamics, development, and distribution of biotic communities. I; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Senior standing; one year of zoology. KENDEIGH.

351. **Genetics.** Principles of heredity. Lectures, readings, and discussions. II; 3 hours, or ½ unit. Prerequisite: Zoology 101, 104, or one semester of any biological science. LUCE.

352. **Genetics.** Laboratory experiments illustrating the principles of heredity, problems, demonstrations. II; 2 hours, or ½ unit. Prerequisite: Credit or registration in Zoology 351. KITZMILLER, LUCE.

361. **Comparative Physiology.** Same as Physiology 361. A comparison of the general physiology of different groups of animals. I; 5 hours, or 1 unit. Prerequisite: Senior standing; three semesters of animal biology; two semesters of chemistry. ANDERSON, PROSSER.

362. **Cellular Physiology.** Same as Physiology 362. A physicochemical analysis of biological functions common to most living cells. II; 5 hours, or 1 unit. Prerequisite: Senior standing; two semesters each of biology and general physics; three semesters of chemistry. ANDERSON, PROSSER.

363. **Endocrinology.** Same as Physiology 363. The glands of internal secretion with special references to the vertebrates. I; 5 hours, or 1 unit. Prerequisite: One semester of elementary zoology or physiology; Zoology 334, or organic chemistry. HALL.

## FOR FURTHER INFORMATION

About admission, scholarships and fellowships, requirements of a particular curriculum, school, or college, or general questions about the University, its offerings and requirements, write or talk to the

**DIRECTOR OF ADMISSIONS AND RECORDS**
**UNIVERSITY OF ILLINOIS, URBANA**

The Director of Admissions and Records will also send you on request other publications of the University, including the catalogs of

- Undergraduate Study
- Graduate College
- College of Dentistry
- College of Engineering
- College of Fine and Applied Arts
- School of Journalism and Communications
- College of Law
- Library School
- College of Medicine
- Occupational Therapy
- College of Pharmacy
- School of Physical Education
- Division of Social Welfare Administration
- College of Veterinary Medicine
- Chicago Undergraduate Division
- Time Tables

About matters of housing, finance, loan funds, part-time employment, student use of motor vehicles, or other questions involving student welfare and campus life, write or talk to the

**DEAN OF STUDENTS**
**UNIVERSITY OF ILLINOIS, URBANA**

About matters concerning a veteran's educational status and plans, write or talk to the

**DIRECTOR, DIVISION OF SPECIAL SERVICES FOR WAR VETERANS**
**UNIVERSITY OF ILLINOIS, 249 ARMORY, CHAMPAIGN**

About matters especially referring to Navy Pier, write or talk to the

**EXAMINER AND RECORDER, UNDERGRADUATE DIVISION**
**UNIVERSITY OF ILLINOIS, NAVY PIER**
**CHICAGO 11, ILLINOIS**

About matters especially referring to the Chicago Professional Colleges, write or talk to the

**EXAMINER AND RECORDER, CHICAGO PROFESSIONAL COLLEGES**
**UNIVERSITY OF ILLINOIS, 1853 WEST POLK STREET**
**CHICAGO 12, ILLINOIS**

For matters concerning a particular college, school, institute, or bureau, which can not be answered by one of the publications or sources listed above, write or talk to the dean or director of the unit in question.

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# undergraduate study

**UNIVERSITY OF ILLINOIS BULLETIN**

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UNIVERSITY OF ILLINOIS

# UNDERGRADUATE STUDY

1952-1953

PUBLISHED BY THE UNIVERSITY **URBANA 1952**

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## UNIVERSITY CALENDAR DEPARTMENTS AT URBANA

### 1952—FIRST SEMESTER

| | |
|---|---|
| Entrance examinations | Sept. 9, Tues.-Sept. 12, Fri. |
| Freshman week and registration | Sept. 15, Mon.-Sept. 20, Sat. |
| Instruction begins | Sept. 22, Mon. |
| Thanksgiving vacation begins | Nov. 26, Wed., 1 P.M. |
| Thanksgiving vacation ends | Dec. 1, Mon., 1 P.M. |
| Illinois Day (State admitted to the Union, 1818) | Dec. 3, Wed. |
| Christmas vacation begins | Dec. 20, Sat., 12 M. |
| Christmas vacation ends | Jan. 5, Mon., 1 P.M. |
| Semester examinations | Jan. 23, Fri.-Jan. 31, Sat. |
| Commencement exercises | Feb. 15, Sun. |

### 1953—SECOND SEMESTER

| | |
|---|---|
| Entrance examinations | Feb. 3, Tues.-Feb. 6, Fri. |
| Registration | Feb. 9, Mon.-Feb. 11, Wed. |
| Instruction begins | Feb. 12, Thurs. |
| University Day (University opened, 1868) | Mar. 2, Mon. |
| Easter vacation begins | April 2, Thurs., 1 P.M. |
| Easter vacation ends | April 8, Wed., 1 P.M. |
| Honors Day (classes dismissed at noon) | May 1, Fri. |
| Memorial Day (holiday) | May 30, Sat. |
| Semester examinations | June 4, Thurs.-June 12, Fri. |
| Commencement exercises | June 21, Sun. |

### 1953—SUMMER SESSION

| | |
|---|---|
| Entrance examinations | June 9, Tues.-June 12, Fri. |
| Registration | June 19, Fri.-June 20, Sat. |
| Instruction begins | June 22, Mon. |
| Independence Day (holiday) | July 4, Sat. |
| Summer session examinations | Aug. 14, Fri.-Aug. 15, Sat. |

# UNIVERSITY CALENDAR UNDERGRADUATE DIVISION AT CHICAGO

## 1952—FIRST SEMESTER

| | |
|---|---|
| Orientation period | Sept. 3, Wed.-Sept. 10, Wed. |
| Registration | Sept. 11, Thurs.-Sept. 13, Sat. |
| Instruction begins | Sept. 15, Mon. |
| Thanksgiving vacation begins | Nov. 26, Wed., 6 P.M. |
| Thanksgiving vacation ends | Dec. 1, Mon., 8 A.M. |
| Illinois Day (State admitted to the Union, 1818) | Dec. 3, Wed. |
| Christmas vacation begins | Dec. 22, Mon., 8 A.M. |
| Christmas vacation ends | Jan. 5. Mon., 8 A.M. |
| Semester examinations | Jan. 16, Fri.-Jan. 24, Sat. |

## 1953—SECOND SEMESTER

| | |
|---|---|
| Orientation period | Feb. 2, Mon.-Feb. 4, Wed. |
| Registration | Feb. 5, Thurs.-Feb. 7, Sat. |
| Instruction begins | Feb. 9, Mon. |
| University Day (University opened, 1868) | Mar. 2, Mon. |
| Easter vacation begins | April 2, Thurs., 6. P.M. |
| Easter vacation ends | April 9, Thurs., 8 A.M. |
| Honors Day | May 8, Fri. |
| Memorial Day (holiday) | May 30, Sat. |
| Semester examinations | June 1, Mon.-June 9, Tues. |

## 1953—SUMMER SESSION

| | |
|---|---|
| Registration | June 19, Fri.-June 20, Sat. |
| Instruction begins | June 22, Mon. |
| Independence Day (holiday) | July 4, Sat. |
| Summer session examinations | Aug. 14, Fri.-Aug. 15, Sat. |

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203 Lincoln Hall

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222 Library

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# GENERAL INFORMATION


ADMISSION

FEES AND EXPENSES

PROFICIENCY EXAMINATIONS

GENERAL REQUIREMENTS FOR GRADUATION

HONORS

LIBRARIES

COUNSELING SERVICES

EMPLOYMENT

SCHOLARSHIPS

LOAN FUNDS

PRIZES AND AWARDS

Illini Union — social and recreational center for students and staff.

# Undergraduate Study

Undergraduate instruction is offered by the University of Illinois in the colleges, schools, and divisions described in this catalog. The curricula and major programs listed under each college are designed either to prepare the student for a specific career in his chosen field or to insure a well-balanced program in liberal arts and sciences. On completion of any one of these curricula a bachelor's degree is conferred. The Undergraduate Division at Chicago in general offers the first two years of curricula and courses identical with those offered on the main campus at Urbana.

Graduate instruction is offered on the Urbana campus of the University of Illinois in the fields of learning described in the Graduate College catalog. Professional and graduate courses in medicine, dentistry, and pharmacy are offered on the campus of the Chicago Professional Colleges of the University and are described in separate catalogs.

**ADMISSION.** For admission to the colleges and schools at Urbana and to the Undergraduate Division at Chicago, each student must file an application blank with the officers listed below. Official credentials should be sent directly from each institution previously attended.

For admission at Urbana, to the Director of Admissions and Records, University of Illinois, Urbana.

For admission to the Undergraduate Division in Chicago, to the Examiner and Recorder, University of Illinois, Navy Pier, Chicago 11.

A permit to enter is issued only on the basis of official detailed credentials, filed in advance, which meet the requirements for admission. Credentials accepted for admission become the property of the University and are kept permanently in the files. If an applicant's credentials are not received until the week before the date for registration, it may not be possible to notify the applicant of his status prior to his arrival on the campus.

Applicants for admission who come from foreign countries must make all arrangements in advance. They must furnish complete official credentials and evidence that they are able to meet in full the cost of attending the University. Certificates in a foreign language must be accompanied by certified translations.

Qualified applicants are admitted at the beginning of any term. Applicants for admission to the College of Engineering, the College of Law, and

the School of Journalism and Communications will find it to their advantage to enter the first semester rather than the second.

All new students, on entering the University, are required to take a physical examination. Before registration, a new student must secure an appointment with the University Health Service for his physical examination. The examination is given by the University at the time of appointment without cost to the student. If the student fails to take the examination at the appointed time and does not present an excuse from the Director of Admissions and Records, a fee of $5 is charged to provide for a special examination, or the student will be required to be examined at his own expense outside the University in a manner meeting the requirements of the Health Service.

Candidates for admission to the School of Physical Education must pass special physical and medical examinations. Those entering occupational therapy must pass a special health examination.

## Requirements for Admission

### AGE

An applicant must be at least sixteen years of age. The dean of the college concerned, however, may admit on petition a student fifteen years of age who meets all other requirements for admission and who is to reside, while attending the University, with his parents or guardian, or with someone selected by them.

### HIGH SCHOOL GRADUATION

To be admitted by certificate, an applicant must be a graduate of an accredited secondary school. If the school is in Illinois, it must be fully recognized by the Superintendent of Public Instruction; if located elsewhere, its rating must be equivalent to full recognition. (For a list of sources from which credits are accepted on certification, see page 19; and for a statement of the conditions on which nongraduates may be admitted, see page 18.)

**High School Graduates Who Rank in the Upper Half of Their Class.** The Director of Admissions is authorized to admit, without adhering to the usual requirements as they pertain to majors and minors, an applicant whose rank in scholarship is in the upper 50 per cent of his graduating class. Such a student, however, must present those specific high school courses that are prerequisite to courses in the curriculum which he desires to follow in the University.

**High School Graduates Who Rank in the Lowest Quarter of Their Class.** A graduate of an accredited high school who is a resident of Illinois, whose rank in scholarship is in the lowest quarter of his graduating class, and who meets the requirements as stated below, is admitted by certificate to probationary status and, in connection with his first registration in the University, is required to take such tests as may be prescribed by the Student Counseling Bureau. Such a student, immediately upon registration, is placed under the special supervision of the dean of the college or the director of the school in which he is enrolled. He may be required to carry a reduced program of work or a program especially arranged to meet his needs.

The student's rank is to be based on work completed in grades nine, ten, eleven, and twelve in the case of four-year high schools, and on work completed in grades ten, eleven and twelve in the case of three-year senior high schools.

**Nonresidents of Illinois.** A nonresident of Illinois seeking admission as a freshman must rank in the upper three-fourths of his high school graduating class.

### APPLICATIONS OF HIGH SCHOOL SENIORS

The Director of Admissions is authorized to consider for admission high school seniors who have not yet graduated, on the basis of the following official documents from the high school principal:

1. Applicants who rank in the upper half of their class: a statement of seven semesters of completed high school work, a statement of courses to be taken in the final semester, the date of probable graduation, and an estimate of the applicant's rank in his class.

2. Residents of Illinois regardless of rank in class and nonresidents who rank in the upper three-fourths: a statement of seven semesters of completed high school work and grades in each subject at the middle of the final semester, the date of probable graduation, and the applicant's rank in his class.

### FIFTEEN UNITS REQUIRED

Fifteen units of acceptable secondary school work are required, including the following:

I. Two majors and one minor, selected from Groups 1-5 below. One of the majors must be English. (For definitions of *Unit*, *Major* and *Minor*, see below.)

II. A total of at least nine units from the fields of English, foreign language, mathematics, science, and social studies, including preparation amounting to a major or minor sequence in at least three different fields. (See Groups 1-5 below.)

III. All subjects prescribed for the curriculum which the applicant desires to enter, as stated in the table on pages 16 and 17.

IV. The six remaining units necessary for admission may be selected from any of the high school subjects which are accepted by an accredited school toward its diploma and which meet the standards for accrediting. Fractional credits of the value of less than one-half unit will not be accepted. Not less than one unit of work will be accepted in a foreign language, elementary algebra, plane geometry, physics, chemistry, or biology.

The University realizes the obligation of the high school to meet fully the needs and interests of all pupils. It, therefore, believes that high schools should offer courses in such fields as agriculture, art, commerce, home economics, industrial arts, and music; and it accepts them as electives for admission.

### DEFINITIONS

**Unit.** A unit course of study in the secondary school is a course covering an academic year and including not less than the equivalent of 120 sixty-minute hours of classroom work. Two hours of work requiring little or no preparation outside the class are considered as equivalent to one hour of prepared classroom work.

**Major.** A major consists of three unit courses in one field. (See special requirements for a major in each of the various fields as stated below.)

**Minor.** A minor consists of two unit courses in one field. (See special requirements for a minor in each of the various fields as stated below.)

### MAJORS AND MINORS

The required majors and minors defined above may be selected from the following five groups:

1. **English.** (In all cases one major must be in English.) Only courses in history and appreciation of literature, composition (including oral composition when given as a part of a basic English course), and grammar will count toward a major.

2. **Foreign Language.** Three units in one language constitute a major. Two units in one language constitute a minor.

3. **Mathematics.** Only courses in algebra, plane geometry, solid and spherical geometry, and trigonometry will be accepted toward a major or minor in this subject. For students entering in September, 1953, and thereafter, the College of Engineering will require four units of mathematics for admission to full freshman status (see page 22). General mathematics may be accepted in lieu of algebra and geometry in cases where the content of the course is essentially the same as that ordinarily included in algebra and geometry.)

## Required and Recommended Subjects for Admission to the Various Undergraduate Curricula

(See also descriptive material about majors and minors on page 15)

| Colleges and Schools | Subjects Required for Admission | Subjects Recommended for Admission |
|---|---|---|
| **COLLEGE OF LIBERAL ARTS AND SCIENCES** | | |
| General Curriculum with majors in American Civilization, Bacteriology, Botany, Classics (Latin or Greek), Economics, English, Entomology, French, Geography, Geology, German, History, History of Art, International Affairs, Italian, Latin-American Studies, Medieval Civilization, Music, Philosophy, Political Science, Psychology, Social Sciences, Sociology, Spanish, Speech, Zoology<br>General Curriculum preparatory to Education, Journalism, Law<br>Division of General Studies<br>Occupational Therapy (See statement of special requirements on page 22)<br>Teacher-training Curricula | English, 3 units [1]<br>Language, 2 units [2] | Language, 3 units in one language, instead of the required 2 units<br>Science, 2 units (including biology)<br>Social Studies, 2 units |
| General Curriculum with majors in Chemistry, Home Economics, Physics, Mathematics, Physiology<br>Special Curricula preparatory to Dentistry,[3] Medicine,[3] Nursing, Veterinary Medicine [3]<br>Teacher-training Curricula | English, 3 units [1]<br>Language, 2 units [2]<br>Algebra, 1 unit<br>Geometry, 1 unit | Mathematics, 3 units, instead of the required 2 units<br>Science, 2 units (including physics or chemistry or both)<br>Social Studies, 2 units |
| Special Curricula in Chemistry and Chemical Engineering | English, 3 units [1]<br>Language, 2 units [2]<br>Algebra, 1½ units<br>Geometry, 1 unit | Language, 4 units (including 2 units in French and 2 units in German)<br>Mathematics, 3 units, instead of the required 2½ units<br>Science, 2 units (including physics or chemistry or both)<br>Social Studies, 2 units |
| **COLLEGE OF AGRICULTURE** | | |
| Curricula in Agricultural Science, Agriculture, Dairy Technology, Floriculture, Food Technology, Home Economics, Pre-Forestry, and Restaurant Management<br>Teacher-training Curricula | English, 3 units [1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Mathematics, 3 units, instead of the required 2 units<br>Science, 2 units (including physics)<br>Social Studies, 2 units |
| **COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION** | | |
| All Fields (Accountancy, Banking and Finance, Commerce and Law, Commercial Teaching, Economics, Industrial Administration, Management, Marketing, Personnel Management, Public Affairs, Secretarial Training) | English, 3 units [1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Advanced Algebra, ½ unit<br>Science, 2 units (including 1 unit with laboratory) |
| **COLLEGE OF EDUCATION** | | |
| Curricula in Industrial Education, for Teachers of the Deaf, and for Teachers of the Mentally Handicapped [4] (other curricula require junior standing in the University) | English, 3 units [1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Industrial Arts, 2 units (for industrial education only)<br>Science, 2 units (including physics or chemistry or both)<br>Social Studies, 2 units |
| Curriculum for Elementary Teachers | English, 3 units [1] | Language, 2 units (for curricula for teachers of the deaf and mentally handicapped) |

**NOTES**

[1] English. Only courses in the history and appreciation of literature, and in composition (including oral composition when given as a part of a basic English course) and grammar, will count toward the three units in English required as a major for admission to all curricula. Four units in English while not required for any curriculum, are recommended by all the colleges and schools.

[2] Language. The foreign language requirement for admission to any curriculum is fulfilled by two units in any one of the following: German, French, Spanish, Italian, Latin, Greek. For some curricula three units in one language are recommended, and for some it is advantageous to have four units in one language or a combination of languages. Less than one unit in a language is not acceptable for admission.

[3] Predental, Premedical, and Preveterinary Requirement. A student entering the predental curriculum, the premedical curriculum, or the preveterinary curriculum as a freshman must have a scholarship rank in the upper half of his high school graduating class. A student transferring to one of these curricula from another college or university must have a scholastic average in his collegiate work not less than 3.5 in terms of the grading system of the University of Illinois. A scholastic average of 3.75 is required of transfers to the premedical curriculum who have completed three or more semesters of work elsewhere.

## Required and Recommended Subjects for Admission to the Various Undergraduate Curricula

(See also descriptive material about majors and minors on page 15)

| Colleges and Schools | Subjects Required for Admission | Subjects Recommended for Admission |
|---|---|---|
| **COLLEGE OF ENGINEERING** | | |
| All Curricula (Aeronautical, Agricultural, Ceramic, Civil, Electrical, General, Mechanical, Metallurgical, Mining, Sanitary, Engineering Physics)<br>(See also page 22) | English, 3 units [1]<br>Algebra, 1½ units [5]<br>Plane Geometry, 1 unit<br>Solid Geometry ½ unit [5] | Language, 2 units<br>Science, 2 units (including physics or chemistry or both)<br>Social Studies, 2 units<br>Industrial Arts, 2 units |
| **COLLEGE OF FINE AND APPLIED ARTS** | | |
| Curriculum in Architecture (with general and engineering options) | English, 3 units [1]<br>Algebra, 1½ units [5]<br>Geometry, 1 unit | Freehand Drawing, 1 unit<br>Science, 2 units (including physics and chemistry)<br>Social Studies, 2 units (including economics and history) |
| Curricula in Art (Advertising Design, Industrial Design, Art Education, History of Art, and Painting) | English, 3 units [1]<br>Language, 2 units [2] | Freehand Drawing, 1 unit<br>Language, 3 units in one language instead of the required 2 units<br>Social Studies, 2 units |
| Curricula in Landscape Architecture and Landscape Operation | English, 3 units [1]<br>Algebra, 1 unit<br>Geometry, 1 unit | Botany, 1 unit<br>Freehand Drawing, 1 unit<br>Mathematics, 3 units instead of the required 2 units<br>Social Studies, 2 units (including civics and economics) |
| **SCHOOL OF MUSIC** | | |
| All Curricula (Instrumental, Voice, and Theory Majors, and Music Education) | English, 3 units [1]<br>Language, 2 units [2]<br>Music (individual examination required) [6] | Music, 1 unit, and additional private study for two years<br>Science, 1 unit (with laboratory)<br>Social Studies, 2 units |
| **SCHOOL OF PHYSICAL EDUCATION** | | |
| Curricula in Dance (for Women), Health Education, Physical Education for Men and for Women, and Recreation | English, 3 units [1] | Science, 3 units (including biology)<br>Social Studies, 2 units<br>Health and safety education and participation in school programs of physical education and athletics |
| **INSTITUTE OF AVIATION** | | |
| Curriculum in Aircraft Maintenance | English, 3 units [1]<br>Algebra, 1 unit<br>Geometry, 1 unit | This is a two-year terminal curriculum |

[4] For admission to the curricula for teachers of the deaf and the mentally handicapped the applicant must rank in the upper 25 per cent of his high school graduating class, or, if he is a transfer student, must have a scholastic average of at least 3.5 (half way between "B" and "C").

[5] Mathematics. In Engineering and Fine and Applied Arts where advanced algebra or solid geometry, or both, are required, students who have only one unit in algebra and one unit in geometry, and who meet all other entrance requirements, may be admitted on condition that the deficiency be removed during their first year of residence. Where one unit in algebra and one unit in geometry are required for admission, general mathematics will be accepted if the content of the course is essentially the same as that ordinarily included in algebra and plane geometry. For all curricula involving chemistry (to which one unit in physics or chemistry or two and one-half units in mathematics are prerequisite), students without credit in physics or chemistry who have only two units in mathematics will be required to take college algebra.

[6] Music Examination. Each applicant for admission to the School of Music is required to take an individual examination in his major field for the purpose of demonstrating that he is qualified and has sufficient knowledge of music to enter courses in applied music. The examination is given four times during the year. No entrance credit is allowed for this examination. For further information, write to the School of Music, Urbana.

4. **Science.** (Including physics; chemistry; biology, or botany and zoology; general science, or physiology and physiography; astronomy; and geology.) The three units required for a major must include at least a total of two units chosen from one or more of the following subjects: physics, chemistry, botany, and zoology. Biology may be offered in place of botany and zoology. The two units required for a minor must include at least one unit from the above subjects.

5. **Social Studies.** (Including history, civics, economics, commercial or economic geography, and sociology.) The three units required for a major must include at least two units in history. The two units required for a minor must include at least one unit in history.

### REQUIRED AND RECOMMENDED SUBJECTS

The second column of the table on pages 16 and 17 shows the special subjects prescribed for admission to the various undergraduate curricula. These are the subjects which are considered essential preparation and without which the student may not be admitted. The requirements are stated in units of credit and not in terms of majors and minors. These prescribed subjects may be counted toward fulfilling the major and minor requirements. In planning his high school work the prospective student should be guided also by the recommended subjects shown in the third column. It will be noted that these recommendations indicate the desirability of presenting more than the minimum requirement of nine units from the fields of English, foreign language, social studies, and science. Students who take a greater amount of work in these areas are apt to have a more satisfactory educational experience in the University.

### GRADUATES OF UNACCREDITED SECONDARY SCHOOLS

Graduates of unaccredited secondary schools which offer four years of instruction are admitted by examination. The Director of Admissions and Records, however, is authorized to admit a student who is a graduate of such an unaccredited secondary school and whose general scholarship rank is in the upper 25 per cent of his graduating class, subject to his passing at the University in advance of admission: (1) a test in English composition and rhetoric; and (2) such other examinations and tests in high school subjects as may be necessary to complete the University entrance requirements and the special requirements of the chosen curriculum.

### STUDENTS OF ACCREDITED SECONDARY SCHOOLS WHO ARE NOT GRADUATES

An applicant who has attended, but who has not been graduated from, an accredited school, must pass entrance examinations in English composition and four units in additional subjects to be designated by the University authorities. The remaining units required for admission may also be made in entrance examinations or may be offered by certificate from an accredited school.

### GRADUATES OF THREE-YEAR SENIOR HIGH SCHOOLS

In the case of graduates of a school organized as a three-year senior high school, including grades ten, eleven, and twelve, at least twelve units must have been taken in the senior high school. Two majors and one minor, or four minors, must be from the fields of English, foreign language, mathematics, science, and social studies. (See Groups 1-5, page 15.) Either a major or a minor must be from the field of English. One unit of a foreign language and one unit of mathematics may be accepted from work completed in the ninth grade as a part of the majors and minors, provided at least seven units of senior high school work have been completed in subjects included in the above-enumerated fields. The remaining five units may be selected from any of the senior high school subjects which are accepted by an accredited high school toward its diploma and which meet the standards of accrediting as defined by the University.

The transcript of credits certified by the senior high school must show any credit in mathematics or foreign language accepted from the ninth grade if these subjects have been continued in the senior high school. Fractional credits of the value of less than

ne-half unit will not be accepted. Not less than one unit of work will be accepted in a oreign language, elementary algebra, plane geometry, physics, chemistry, and biology.

### SOURCES OF ACCEPTABLE CREDITS

The credits required for admission to the undergraduate departments, as detailed bove, may be secured in three ways: (1) by *certificate* from an accredited high school r other secondary school; (2) by *examination;* and (3) by *transfer* from another uni- ersity or college of recognized standing.

### ADMISSION BY CERTIFICATE

A student presenting a certificate from any fully recognized high school or pre- aratory school in Illinois is given entrance credit for all the subjects named therein or which the school is specifically accredited.

Entrance credits are also accepted on certificate from the following sources:

1. Schools accredited by the North Central Association of Colleges and Secondary chools.
2. Schools accredited by the Southern Association of Colleges and Secondary Schools.
3. Schools approved by the New England College Entrance Certificate Board.
4. High schools and academies registered by the Regents of the University of the tate of New York.
5. Schools accredited to the state universities which are included in the membership f the North Central Association and the Southern Association of Colleges and Second- ry Schools, provided the certificate shows that the Illinois standard time requirements ave been met.
6. Schools approved by state universities in states not included in the territories of he above-mentioned accrediting agencies.
7. The state teachers colleges of Illinois and other state teachers colleges having qual requirements for graduation.

### ADMISSION BY EXAMINATION

Entrance examinations are given by the University several times each year as shown n the calendar on page 4. They are given in Chicago four times each year, in March, une, August, and December. These examinations cover substantially all the subjects re- uired or accepted for admission. For brief outlines of the requirements in the various ubjects, textbooks suggested for study, and examination programs, address the Director f Admissions and Records.

Credit for admission will be accepted from examinations conducted by the College ntrance Examination Board and by the New York Regents, if passed with a grade of 0 per cent or higher, subject to the requirements of majors, minors, and special sub- ects as listed on preceding pages.

### ADMISSION BY TRANSFER

A person who has attended another college or university of recognized standing ill be considered for admission to the University of Illinois on presenting (1) a trans- ript of his college record, (2) a certificate of honorable dismissal from the institution rom which he comes, and (3) an official statement of his preparatory school work. A nonresident of Illinois seeking transfer to any undergraduate curriculum must present scholarship average of at least 3.0 ("C") in terms of the grading system of the Uni- ersity of Illinois.

A person whose record at some other institution comes within either of the following lassifications may enter the University only on approval of the dean of the college con- erned and under conditions imposed by him: (1) A person on probation at, or dropped rom, another institution for poor scholarship or for disciplinary reasons. (In the latter ase he must also obtain approval of the University Senate Committee on Discipline.) 2) A resident of Illinois whose scholastic average is less than "C" (3.0) in terms of the rading system of the University of Illinois.

An applicant with a scholarship average of at least 3.3, whose credentials otherwise are satisfactory, may be granted *provisional* admission to any curriculum not requiring a higher average, at any time after he has begun his final semester or quarter at the institution he is currently attending. (Under the grading system at the University 3.0 is "C" and 4.0 is "B".)

No substitutes will be accepted for the high school subjects *prescribed* by the University or for the requirement of high school graduation, except that: (1) A student who comes from an institution rated in Class A by the University with a record of at least thirty semester hours without failures, and with an average grade ten points above the passing grade of the college, may be matriculated in a similar curriculum in the University, irrespective of deficiencies in prescribed subjects (except when necessary as prerequisites for advanced work to be taken here), whether or not he is a high school graduate. (2) The Director of Admissions is authorized to waive the high school graduation requirement, but not the subject requirements, in the case of a transfer student who has completed a year of satisfactory work in a college, normal school, or junior college rated in Class A or Class B by the University.

Credits may be accepted for advanced standing from another university or a college, or a junior college of recognized standing, or from a state teachers' college. A student who has passed a course at the University of Illinois may not be given credit for the same course taken elsewhere. In general it is unwise for a student to enter a specialized curriculum at the University as late as the beginning of the senior year. Students intending to transfer to the University should send their credentials to the Director of Admissions as early as possible.

If transferring to the predental curriculum, the premedical curriculum, the preveterinary curriculum, the curriculum preparatory to teaching in the elementary school, or the curricula for teachers of the deaf and mentally handicapped, the student must have a scholastic average in his college work of at least 3.5 in terms of the grading system of the University of Illinois. If transferring to the premedical curriculum with three or more semesters completed elsewhere, he must have a scholastic average of not less than 3.75. If transferring to the curriculum in engineering physics, he must have a scholastic average of at least 3.5 in all subjects, exclusive of required physical education, and a combined grade average of at least 3.5 in all subjects in mathematics and physics.

The registration of students in chemistry courses, other than those ordinarily open to freshmen and sophomores, is limited with few exceptions, to those having a 3.5 general average, exclusive of the required work in physical education and hygiene, or an average of at least 3.5 in chemistry courses. Those who desire to register in the curriculum of chemistry or chemical engineering must fulfill the former requirements. Transfer students to be admitted must have a corresponding record in the institution (or institutions) from which they transfer and must maintain a similar average at the University of Illinois.

Students in large numbers enter the University after completing one, two, or even three years at the other universities and colleges in Illinois. In recognition of this situation the University is cooperating with the higher institutions in the state in their endeavor to coordinate their work with that of the University. In order that information may be had in advance in regard to the credit to be allowed from a specific institution the University has adopted certain standards for accrediting and has classified the higher institutions within the state in accordance with the manner in which they are able to meet these standards. Students from the colleges which have met these standards in full, on entering the University, receive hour-for-hour credit; but in applying for a degree they are expected to conform to all the requirements of their chosen curricula. The Director of Admissions, on application, will furnish full information in regard to the transfer of credit.

## ADVANCED STANDING BY EXAMINATION

Advanced standing in the undergraduate colleges is granted only by examination unless the applicant is from an approved school.

## UNDERGRADUATE CREDIT FOR SERVICE AND FOR EDUCATION IN THE ARMED FORCES

The University, under general provisions administered by the Committee on Admissions from Higher Institutions, will recognize for college credit certain training and experience in the Armed Forces. Credit in military training and required physical education and hygiene will be approved when a person, honorably discharged, presents evidence that he has completed the basic training program in the Air Force, Army, Navy, Marine Corps, or Coast Guard. The Committee will recognize for credit correspondence courses of college grade, the general educational development examinations and the examinations in special fields prepared by the United States Armed Forces Institute. The College Training Programs of the Army, Navy, and Marine Corps which functioned during World War II will be accepted as credit when transferred from the institution where they were taken. The Committee will consider for credit work done in Air Force, Army, Navy, Marine Corps, and Coast Guard Specialized and Technical Schools where its equivalence in terms of college courses is established by proficiency examinations or where such courses have been recommended for college credit in the Guide to the Evaluation of Educational Experience in the Armed Services published by the American Council on Education.

## UNCLASSIFIED STUDENTS

Persons over twenty-one years of age may be admitted as unclassified students (not candidates for a degree) in the undergraduate colleges, provided they secure the recommendation of the instructor whose work they wish to take and the approval of the dean of the college concerned. They must give evidence that they possess the requisite information and ability to pursue profitably, as unclassified students, their chosen subjects, and they must meet the special requirements for the particular college in which they wish to enroll, as stated below.

No one may enroll as an unclassified student in any school or college of the University for *more than two years,* except by special permission, application for which must be made through the dean of the college.

A person registered as an unclassified student in one college and desiring to take a course in another college of the University must obtain the approval of the dean of the latter college.

For certain of its colleges the University has adopted special requirements for the admission of unclassified students. These are as follows:

**College of Agriculture.** In the case of men, two years of experience in practical agriculture are required. Any applicant accepted who is unable to satisfy the regular entrance requirements in English must study English in the University until the deficiency is removed.

**College of Commerce and Business Administration.** A written application must be presented, accompanied by official certificates showing the character and extent of preparatory work accomplished and honorable dismissal from the school last attended. Statements from employers or official superiors may also be presented as collateral evidence of the candidate's qualifications.

**College of Engineering.** The applicant must satisfy the regular entrance requirements in mathematics (algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit) and English (English composition and literature, 3 units).

**College of Law.** No credit earned by an unclassified student in the College of Law may be counted toward a degree in law.

**College of Liberal Arts and Sciences.** A written application must be presented, accompanied by official certificates indicating the applicant's preparatory work and showing honorable dismissal from the school last attended.

## ADMISSION TO CORRESPONDENCE COURSES

Correspondence courses are open to any applicants who can meet the University entrance requirements and also to persons eighteen or more years of age whose applications are approved by the Dean of University Extension. For further information address the Dean, 118 Illini Hall, Champaign, Illinois.

## ADMISSION TO THE COLLEGE OF ENGINEERING BEGINNING SEPTEMBER, 1953

For students entering the College of Engineering in September, 1953, and thereafter, the mathematics requirement for admission to full freshman standing will be as follows: algebra, 2 units; plane geometry, 1 unit; solid geometry, ½ unit; trigonometry, ½ unit.

Students who present only one unit in algebra and one unit in geometry, and who meet all other requirements, may be admitted on the condition that the deficiencies be removed during their first year of residence, and with the understanding that they can not complete the requirements for a degree in eight semesters.

Students who do not present the four units in mathematics as specified may be admitted to full standing by passing a proficiency examination at the University which will indicate their preparation is adequate for entrance into analytic geometry.

## ADMISSION TO THE OCCUPATIONAL THERAPY CURRICULUM

The curriculum in occupational therapy, leading to the degree of Bachelor of Science in Occupational Therapy from the College of Medicine, is offered to men and women who are able to meet the requirements listed below.

At present the program consists of a minimum of six semesters in the College of Liberal Arts and Sciences at Urbana, and five terms in the College of Medicine in Chicago. The work on the Urbana campus is divided into two levels. The first two semesters constitute the preprofessional curriculum, while the third, fourth, fifth, and sixth semesters constitute the professional phase of the work at Urbana.

**Preprofessional Curriculum.** An applicant for admission to this curriculum must meet the following requirements:

1. He must be a graduate of an accredited high school and meet the general requirements for admission to the College of Liberal Arts and Sciences;
2. He must rank in the upper 50 per cent of his high school graduating class, or satisfactorily pass examinations given by the Student Counseling Bureau;
3. He must be under thirty years of age;
4. A health examination given by the University Health Officer must be passed satisfactorily;
5. An interview is required with either the Associate Dean of the College of Liberal Arts and Sciences or the Head of the Department of Occupational Therapy.

All of the above requirements must be certified to the Director of Admissions before a permit to enter is issued. The applicant should arrange for the examinations and interview well in advance of the beginning date of the semester in which he plans to enter.

**Professional Curriculum.** The number of students admitted to the professional curriculum is limited by facilities in the College of Medicine. Selections for admission to this curriculum are made by the Committee on Admissions. Candidates are selected on the basis of scholastic record and such examinations and other evidence as the Committee may require, and are notified of their acceptance or rejection prior to the beginning of their third semester of registration at Urbana.

Permission to pursue that portion of the work which is given in the College of Medicine is dependent on the achievement in previous university work. A university scholarship average of 3.5 is a minimum requirement. Eligibility is determined by the Admissions Committee of the Curriculum in Occupational Therapy after a careful study is made of all pertinent evidence. Other factors being equal, preference will be given to candidates who are residents of Illinois.

**Transfer Students.** Transfer students must complete an interview as indicated in the general admission requirements, and they must also pass the physical examination. The results must be certified to the Director of Admissions before a permit to enter is issued. Before being eligible for admission to the College of Medicine, transfer students, in all but exceptional cases, must complete a minimum of two semesters in residence at Urbana. After admission by transfer, such students are governed by the same regulations applicable to other students in the curriculum.

**FEES AND EXPENSES.** Estimated expenses for undergraduate students, exclusive of such variable items as clothing, railroad fare, and recreation, are given in the budgets below. These budgets cover two semesters for students who are residents of Illinois. For those who are not residents of Illinois the tuition is higher.

| | *Minimum* | *Moderate* |
|---|---|---|
| Tuition and fees | $120 | $120 |
| Textbooks | 35 | 45 |
| Other school supplies | 15 | 25 |
| Room and board (figured for nine months) | 585 | 720 |
| Laundry (mailed home) | 20 | 20 |
| Miscellaneous | 45 | 90 |
| *Total, Two Semesters* | $820 | $1,020 |

### Tuition and Fees in Undergraduate Colleges and Schools

(Payable in full when the student registers)

**Tuition Fee.**
All students who are residents of Illinois, except those holding scholarships, pay each semester a tuition fee of ..... $ 40.00
All students who are not residents of Illinois, pay each semester a tuition fee of ..... 150.00

**Hospital and Medical Service Fee.** All students, including persons on part-time appointment on the University staff or the staffs of the allied surveys or laboratories, except students taking not more than one unit of graduate work or five hours of undergraduate work in a semester, or one-half unit of graduate work or three hours of undergraduate work in the eight-week summer session, pay each semester, as insurance for hospital and medical service, a fee of ..... 5.00
(Note: A student who presents evidence of participation in any other group insurance system providing the same benefits as those covered by the University fee, may petition through the office of the Dean of Students for a refund of this fee.)

**Laboratory, Library, and Supply Fee.** Students taking more than eight hours of instruction, pay each semester a laboratory, library, and supply fee of..... 8.00
(Students taking less than this amount of instruction pay $4 each semester.)

**Late Registration Fee.** Former students who register after the regular registration days in either semester pay a late registration fee of ..... 5.00

**Change Fee.** For every change slip issued later than the Saturday following registration, the fee is ..... 1.00

**Listener's Fee.** Persons not connected with the University who attend classes as listeners pay for each course each semester ..... 7.50

**Transcript Fee.** Each student who has paid all his University fees is entitled to receive, without charge, one transcript of his record. For each additional transcript the fee is ..... .50

**Special Examination Fee.** For any special examination to remove a failure the fee is ..... 5.00

**Illini Union Service Charge.** All students registering for resident work in the Urbana departments of the University, except graduate students who are members of the University staff and others who are registered for not more than one unit of graduate work or not more than five semester hours of undergraduate work, are assessed each semester an Illini Union service charge of ..... 7.00

**Activities Service Fee.** All students in the Undergraduate Division at Chicago, except those who are registered for not more than five semester hours, pay each semester a student activities service fee of ..... 6.00

**Fee for Instruction in University High School.** University students at Urbana who also register in the University High School pay, in addition to their University fees, for each half-unit each semester ..... 10.00
(Provided that the total additional charges shall not exceed $25 a semester.)

**Flight-Training Fee.** Students taking flight-training courses in the Institute of Aviation pay each semester a materials and supply fee of ..... 250.00

**Identification Card.** Each student on completing registration in each semester is given an identification card for use in obtaining loans of library books, locks, towels, and other equipment.

**Service Charge for Deferred Fees.** A service charge of 10 per cent of the amount of fees deferred, but not to exceed $3 a semester, is assessed for the privilege of deferring fees, and this charge must be paid on the day of registration. If deferred fees are paid in full within ten days after registration, the service charge is refunded *except* that a minimum service charge of $1 is retained by the University in all cases. The service charge and all charges from previous semesters must be paid on the day of registration.

**Refunds of Fees.** In case a student withdraws from a course or from the University during the first ten days of instruction, the total amount of his fees for the work dropped will be refunded. After ten days and before the middle of the semester, a rebate of one-half the fees will be made. After the middle of the semester, no rebate will be allowed. In the summer term, for students registered for eight weeks, the total amount of fees paid will be refunded if withdrawal occurs within the first five days; one-half the amount after the first five days but within the first four weeks; and nothing after the beginning of the fifth week.

### SUMMER SESSION FEES

Students registered in the eight-week summer session pay fees as listed on page 23 except that the tuition fee for residents of Illinois is $20; and for nonresidents, $75; laboratory, library, and supply fee, $4; hospital and medical service fee, $2.50; Illini Union service charge (Urbana only), $3.50; activities service fee (Chicago Undergraduate Division only), $3.

Students registering for the Summer Camp for Surveying Instruction pay a tuition fee of $20 if residents of Illinois, or $75 if nonresidents of Illinois; laboratory, library, and supply fee, $4; and hospital and medical service fee, $2.50.

### FEES FOR PART-TIME STUDENTS

Undergraduates registering for reduced schedules pay, instead of the regular tuition fee, $3 per credit hour if a resident of Illinois, or $10 per credit hour is not a resident of Illinois; provided registration is for not more than eight credit hours in one semester or four hours in eight-week summer courses.

### EXEMPTION FROM FEES FOR MEMBERS OF THE UNIVERSITY STAFF

Persons on the academic and administrative staffs of the University in any capacity, or who are on fellowship appointment in the Graduate College, or who are on permanent employment on the nonacademic staff (subject to the approval of the head of their department or division), may register in University courses for which they are eligible for admission without payment of the tuition fee and the laboratory, library, and supply fee, provided their annual salary is $2,400 or less for a nine-month appointment or $2,934 or less for a twelve-month appointment.

Permanent nonacademic employees without regard to salary may register without payment of any fees or deposits under the following conditions: (1) In any regular University course in which the employee is requested by the Department, with the concurrence of the Director of Nonacademic Personnel, to enroll for the improvement of the employee's present work. (2) Any special course looking toward improving University service organized at the request of the Director of Nonacademic Personnel in cooperation with the teaching staff, the employee concerned, and the department in which such employee is located.

**PROFICIENCY EXAMINATIONS.** Each semester the University gives proficiency examinations, similar to the regular semester examinations, in courses normally open to freshmen and sophomores. Proficiency examinations in more advanced undergraduate subjects are given on recommendation of the head of the department and approval of the dean of the college. No fee is charged for these examinations. A student who passes a proficiency examination is given credit toward graduation, provided that this does not duplicate credit counted for his admission to the University and that the course is acceptable in his curriculum. The grade in proficiency examinations is "pass" or "not pass," but no student is given a grade of "pass" unless he has made at least "C" in the examination. No official record is made of failures in these examinations.

Proficiency examinations are given under the following restrictions: (1) They may be taken only by persons who are in residence, or who are candidates for degrees at the close of the college year in which the examination is to be given and who need no more than ten semester hours to complete the requirements for their degrees. (2) They may not be taken by students who have received credit for more than one semester of work in the subject in advance of the course in which the examination is requested. (3) They may not be taken to raise grades or to remove failures in courses.

**GENERAL REQUIREMENTS FOR GRADUATION.** A bachelor's degree is conferred on a student who satisfactorily completes a curriculum in one of the colleges or schools at Urbana, doing either the first three years (not less than ninety semester hours) or the last year (not less than thirty semester hours) of work in residence. Each candidate for a bachelor's degree must meet the general requirements of the University with respect to registration, residence, military training, hygiene, physical education, and rhetoric; must pass in the subjects which are prescribed in his curriculum; must conform to the directions of that curriculum in regard to electives and the total number of hours required for graduation; and must meet the minimum scholarship requirements which the University has approved for his college or school.

The system of grading is as follows: "A," excellent; "B," good; "C," fair; "D," poor (but passing); "E," failure. Numerical equivalents of these grades on the basis of which averages are made are as follows: "A" = 5; "B" = 4; "C" = 3; "D" = 2; "E" = 1. Examinations are conducted by the faculty at the end of each semester.

The required work includes, for men, military training, hygiene, physical education, and rhetoric; for women, hygiene, physical education, and rhetoric. Women entering the University as freshmen are required to obtain credit for four semesters of work in physical education and one semester in hygiene; those entering with sophomore standing, two semesters in physical education. Hygiene is required of all students entering with less than thirty

semester hours of credit. Men entering with less than fifty-six semester hours of credit are required to secure four semesters of credit in physical education including the amount transferred; those entering with fifty-six or more semester hours are exempt. All students entering with junior or senior standing are relieved from the requirements in physical education. Men in the freshman and sophomore classes, who are under twenty-two years of age when entering the University, are required to take basic military training (four semesters) unless exempted or excused by special regulations.

All students entering the University as freshmen direct from secondary school are required to take a placement test in rhetoric. Those who fail to pass this test must make up the deficiency by tutoring, correspondence study, or by passing Rhetoric 100, a noncredit course meeting three hours each week. A student who fails to pass the placement test or Rhetoric 100 by the beginning of his third semester must withdraw until he does pass.

A satisfactory proficiency in the use of written English is a requirement for all undergraduate degrees awarded by the Urbana divisions of the University. In order to assure such proficiency, students who received grades of "C" or "D" in Rhetoric 102, or its equivalent, are required to take an English qualifying examination before graduating. Those who fail to pass the qualifying examination are required to pass an extra semester course in rhetoric (Rhetoric 200). A foreign student must attain the proficiency in English necessary for adequate work in his other academic courses.

In any curriculum in which less than fifteen hours of laboratory science are required, a student who enters without at least one unit of laboratory science must substitute five hours of laboratory science for five hours of electives in the requirements for graduation.

In a beginning course in a foreign language not less than a full year's work (normally eight credit hours) will be accepted toward graduation.

If a thesis is to be submitted in partial fulfillment of the requirements for a bachelor's degree, the subject must be announced by the end of the sixth week of instruction in the first semester of the student's senior year. The completed thesis on regulation paper must be presented to the dean of the proper college. The work must be done under the direction of a professor in the department concerned and must be in the line of the curriculum from which the degree is expected.

After matriculation, a student may count, toward his degree, as much as sixty semester hours of credit earned in correspondence study in subjects passed with grades of "C" or higher, under the following conditions: (1) if he completes all the remaining requirements for the degree in residence at the University; or (2) if he presents acceptable residence credit for work done elsewhere and completes the requirements needed for his degree in residence at the University. In all such cases the senior year (of not less than thirty semester hours) must be done in residence at the University.

A student who has earned three years of residence credit at the University (a minimum of ninety semester hours) may do his senior year in

orrespondence study, subject to meeting all the requirements for his degree s announced by his college or school.

Degrees are conferred at the Commencement exercises in June and ebruary. Students who are to complete their work for the bachelor's or ie master's degree at the end of an eight-week summer term may be recom- ended for degrees in August.

A student who has received one bachelor's degree may receive a second achelor's degree, provided that all specified requirements for both degrees e fully met, and provided also that the curriculum offered for the second egree includes at least thirty semester hours not counted for the first degree.

**ONORS.** Students who attain a high grade of scholarship are given ficial recognition by the University according to the following system of nors. The plan for Honors Day is applicable to undergraduates who are rolled in a four-year curriculum requiring only high school preparation r admission, or in the College of Education or in the School of Journalism nd Communications.

## Honors Day

Honors Day is observed annually by a convocation of students and members of the culty, with an address by a distinguished speaker. Announcement is made of the election students to honorary societies in which the basis of election meets a standard of schol- ship approved by the Committee on Honors Day. Announcement is made also of organ- ed groups of students whose average is equivalent to 0.2 above the average of all ndergraduates on the basis of methods employed by the University authorities in deter- ining group averages. Special recognition is given to undergraduate students who have stinguished themselves in scholarship during the two semesters previous to Honors ay (with the exception that in case of freshmen the basis of award is the work of the st semester). Three grades of honors are awarded, as follows:

**Class Honors.** Students in the upper 10 per cent of each class within the respective hools or colleges are awarded Class Honors and are entitled to have their names printed the Convocation program in recognition of their high scholarship, provided that no ident shall be included whose average is below "B."

**College Honors.** Students in the upper 3 per cent of the sophomore, junior, and senior sses within the respective schools and colleges are awarded College Honors in recogni- n of their superior scholarship.

**University Honors (Bronze Tablet).** (a) Those seniors who have been in the upper 3 r cent of their class in the respective schools and colleges in the four semesters preced- g Honors Day, and, therefore, have been awarded College Honors in both junior and nior years, are awarded University Honors in recognition of their sustained excellence scholarship, and are entitled to have their names inscribed on the Bronze Tablet. b) Other senior students who have earned College Honors twice, and whose scholastic erages for the first seven semesters are equal to or higher than the four-semester aver- e of the lowest student currently chosen for University Honors from their college, under ), are also entitled to have their names inscribed on the Bronze Tablet. (c) Senior trans- r students who have not been at the University of Illinois long enough to be considered der (a) or (b) are also entitled to have their names inscribed on the Bronze Tablet, ovided that: (1) their scholastic averages in the University of Illinois for the three ior semesters are equal to or higher than the four-semester average of the lowest stu- nt currently chosen for University Honors from their college under (a); and that (2) eir averages in transferred credits for the year prior to their transfer are at least equal the average of those chosen for University Honors under (a).

The awards are based on the attainments of the students as shown by the scholas records on file in the office of the Director of Admissions and Records. The students a organizations to be given honors are selected by the University Senate through its Co mittee on Honors Day, and on the recommendation of the deans of the various colleg

A student whose name is among the upper 10 per cent of his class in accordance w the foregoing plan, at the convocation held in his junior year, is permitted so to adj the studies of his senior year as to allow him freedom to put a considerable proportion his time on some selected subject of study or investigation under the supervision of t department concerned, provided that such arrangement does not cause omission of p scribed subjects in set curricula except by special permission of the dean of his colle In lieu of a final examination the department may require such reports or theses as deems most suitable. The amount of approved work which may be thus taken duri the senior year may not exceed the equivalent of a total of ten semester hours if tak within one department or of sixteen semester hours if in two departments. A stud availing himself of the opportunity which this plan offers may not register for more th a total of eighteen hours either semester of his senior year.

## Graduation with Honors

With the approval of the University Senate and the Board of Trustees, any coll or school may prescribe the conditions under which candidates for degrees may recommended for graduation with honors. When a proposal by a college or school h thus been approved the following plan of graduation with honors ceases to apply to t division of the University. (For graduation with honors from the College of Agricultu see page 53; the College of Fine and Applied Arts, see page 127; the College of Libe Arts and Sciences, see page 164).

The University Senate may recommend candidates for bachelors' degrees w honors in a particular field under the following conditions:

To be considered for honors, a student must have been in residence at the Univ sity for at least four semesters, or have earned in residence at least sixty hours.

For the degree with *Honors*, the student must have received the grade of "A" in least one-half of the semester hours accepted in satisfaction of the requirements fo major, or in a minimum of twelve hours in *approved courses in his field of specializati* exclusive of beginning courses open to freshmen, and no grade below "C" in any of work offered in his major or field of specialization. He must have attained a grade of lower than "B" in at least three-fourths of all other work which he presents for grad tion, exclusive of courses during his freshman year.

For the degree with *High Honors*, constituting a recognition of work of exceptio merit, the student must have received the grade of "A" in at least three-fourths of work offered in courses accepted in satisfaction of the requirements for a major or i minimum of fifteen hours in *approved courses in the field of specialization*, exclusive beginning courses open only to freshmen, and no grade below "B" in the work offere his major or field of specialization. He must also have attained a grade not lower t "B" in at least three-fourths of all the other work which he presents for graduat exclusive of courses taken during his freshman year. In addition he must have c pleted satisfactorily at least ten hours in courses open to advanced undergraduate graduate students, or courses approved for this purpose by the department in his fiel specialization. He must either present an acceptable thesis or pass a comprehensive amination based on a course of study approved by that department.

The thesis or course of study in the field of specialization shall carry credit fo least four semester hours, irrespective of whether the student eventually receives *H Honors* or not; and the instructor in charge shall report to the Director of Admiss and Records a grade for each semester, based on the student's progress.

These distinctions shall be noted on the student's baccalaureate diploma and in Commencement program, and the winners shall receive special consideration in dep mental recommendation for graduate scholarships and for professional positions.

For graduation with honors in the professional schools, see the appropriate schoo college bulletin.

**LIBRARIES.** The University Library's resources for study and research are outstanding. Its present collections exceed 2,476,954 volumes, and all except about 146,000 of them are located in Urbana. The remainder are held by the Library of Medical Sciences in Chicago and the Library of the Undergraduate Division in Chicago.

In addition to the figures for cataloged volumes cited above, the University Library contains approximately 500,000 pamphlets, 127,000 maps, and 26,000 music scores and parts. More than 17,000 periodicals and newspapers are received currently.

Outstanding collections have been developed for a variety of fields. In the humanities, strong areas include classical literature, history, and archaeology; sixteenth and seventeenth century English literature, especially the Milton-Shakespeare period; French, Italian, and Spanish literature; German literature of the sixteenth and seventeenth centuries; and comparative philology. In the fine arts, architecture, landscape architecture, and music are noteworthy.

In the social sciences, the Library's holdings are significant for western United States history, Latin-American history of the Revolutionary period, Italian history, medieval and modern European history, German history for 1830-1900, Irish history, international law and relations, political science, law, economics, labor and industrial relations, and education.

For science and technology, collections of high rank are held in mathematics, chemistry, biological sciences (especially parasitology, entomology, and ornithology), physics, geology, engineering, and agriculture.

The Library's bibliographical facilities comprise a union catalog of more than 3,000,000 cards, representing titles owned by about two dozen major American and foreign libraries; printed catalogs of libraries, e.g., the Bibliothèque Nationale, British Museum, and Library of Congress; national and trade bibliographies of all countries for which such works have been issued; bibliographies of special subjects; and similar aids.

A number of departmental and divisional libraries are maintained. Following are the principal separately administered collections in the central library building: Classics; Commerce and Sociology; Education, Philosophy, and Psychology; English; Germanic and Romance Languages; History and Political Science; Library Science; and Physical Education. Also in the central building is a separate undergraduate library containing a general collection of over 27,000 volumes.

Elsewhere on the campus are departmental libraries for the following fields: Agriculture, Architecture and Fine Arts, Chemistry, Engineering, Journalism, Landscape Architecture, Law, Mathematics, Music, Natural History (biological sciences, geology, and geography), Physics, and Veterinary Medicine.

**COUNSELING SERVICES.** The University makes every effort to help st dents through the problems of college years. At registration time, a spec adviser helps the student select and arrange his courses. The deans of t colleges, directors of the schools, heads of departments, and other membe of the faculty devote a large part of their time to advising students cc cerning their classroom work and programs. The problems of student w fare outside the classroom are handled chiefly by three general Univers offices, the Director of Admissions and Records, the Dean of Students, a the Student Counseling Bureau.

The Director of Admissions and Records, through correspondence a personal conferences, provides general information about the Univers and specific information about admission. He is in charge of student ac demic records, awarding and administering undergraduate scholarships, a is chairman of the Freshman Week Committee.

The Dean of Students is in charge of most matters of student welfa and activities. As part of his organization, the Dean of Men and Dean Women and their assistants are general advisers to whom students m turn for assistance and advice. Questions asked these advisers are extrem varied: problems of personal adjustment to campus life, what curricula choose, how to register, how to locate suitable housing, how to find pa time employment, how to budget expenses, what loan funds and schol ships are available, questions about activities, fraternity and sorority plec ing, and interpretation of University rules. The offices of these advis are open throughout the day, and staff members are always on call emergencies. Any student may go to them, and inquiries from parents a guardians are welcomed.

The Student Counseling Bureau provides students with the opportun of receiving some of the best professional counseling and scientific aptitu testing services available. Through these services the student can secu information about his abilities, interests, and personality which will enal him to select more wisely a course of study and a later vocation. Th services are available during the summer before he registers, and any ti during his university career. The Counseling Bureau provides special he for those who do not concentrate as well, read as rapidly, or study efficiently as they are capable of doing. The trained counselors and p chologists on the staff of the Bureau can also help with personal a psychological problems, such as over-nervousness on examinations, lack confidence, or with other worries and conflicts which could interfere w a successful university career. Students are invited to make use of services of the Student Counseling Bureau at any time.

**EMPLOYMENT.** Students who need to work part-time while they are the University may get information and assistance from the student e

ployment office, a division of the Dean of Men's office. Women students who want board-and-room jobs should consult the Dean of Women.

The employment service does not guarantee to find jobs for everyone, but there is no scarcity of opportunities. Rates vary from 60 cents to $1.50 an hour, depending on the type of work and the responsibility involved. Board jobs usually require three hours of work a day; board-and-room jobs, four hours.

Students are not advised to try to earn their total support while at the University, and freshmen are not advised to work, at least for the first semester, unless it is absolutely necessary for them to do so. If it is necessary, however, the offices of the Dean of Men or Women will assist in arranging class schedules and work which will least interfere with normal university attendance. The University recommends, however, that every new student have a cash reserve for the school year of at least $400.

**SCHOLARSHIPS.** Unless otherwise stated, an undergraduate scholarship covers the tuition fee in any department of the University. For more detailed information, apply to the Director of Admissions and Records.

### Scholarships Awarded by County Competitive Examination

**Agriculture and Home Economics Scholarships.** Two scholarships for each county—one for students in agriculture and one for students in home economics—are awarded to candidates ranking in the upper 50 per cent of their high school graduating class, or if one year or more of college work has been completed, averaging fifteen points above the passing grade in such work, who pass the competitive County Scholarship examination (see below).

**County Scholarships.** One scholarship for each county in Illinois is created by statute, and sixty-six additional scholarships for Cook County have been established by the Board of Trustees. These are awarded by competitive examinations given on the first Saturday in June under the supervision of the County Superintendent of Schools. Candidates write on English (rhetoric) and on two of the following fields: mathematics, natural science, and social studies. A candidate who has had college work is not eligible.

**Scholarships for Children of Veterans of World War I and World War II.** By act of the legislature (1947) one scholarship is available in each county in Illinois each year for a child of a veteran of World War I and one each year for a child of a veteran of World War II. This scholarship is awarded to the candidate who receives the highest grade in the competitive examination held on the first Saturday in June each year as described in the paragraph on County Scholarships above except that preference shall be given to children of veterans who are deceased or disabled. It exempts the holder from the tuition fees for four years in any department of the University. Proof of service of the war veteran and of his relationship to the candidate is required.

### Scholarships Awarded for Military Service

**Military Scholarships.** Acts of the General Assembly passed in 1919 and 1943 provide scholarships for veterans of World War I, World War II, and the period of the emergency following World War II, who, at the time of enlistment, were residents of Illinois or students in the University of Illinois. These scholarships exempt the holders from the tuition fee for four years in any department of the University.

## Scholarships Awarded on Nomination of Members of the General Assembly

**General Assembly Scholarships.** Each member of the General Assembly may nomin ate annually one student from his district for a four-year scholarship which will exemp the holder from tuition in any department of the University.

## Scholarships Awarded by the University Committee on Special Undergraduate Scholarships

Applications for special undergraduate scholarships may be filed in the office of th Director of Admissions and Records after March 1 each year.

### SCHOLARSHIPS GOOD IN ANY COLLEGE

**Alpha Phi Omega Scholarships.** From funds given annually by Alpha Phi Omega fra ternity, scholarships in varying amounts are awarded to students with superior schola ship records who need financial aid.

**Campus Chest, Woman's League, and Student Affairs Scholarships.** The Campu Chest, the Woman's League, and the Committee on Student Affairs have made availab funds from which annual scholarships of varying amounts are awarded.

**Foreign Students Scholarships.** The Board of Trustees has established twenty-fiv scholarships each year, covering the tuition fee, for students from countries friendly t the United States. Applicants for these scholarships are selected through recommendatio of the Institute of International Education. Other applicants should apply to the Direct of Admissions and Records of the University, who serves as chairman of the committe which selects the candidates.

**General Undergraduate Scholarships.** Scholarships are granted in varying amoun from this fund to undergraduate students. A portion of the fines paid by students f violations of University regulations and undesignated gifts for scholarships are deposite in this fund.

**John M. and Louisa C. Gregory Scholarships.** Scholarships of $100 each are ava able under the will of Mrs. Louisa C. Gregory, which provides that the applicants l "self-sustaining students free from the vices of smoking and chewing tobacco and from th use of intoxicating liquors." The scholarships are awarded to students who have been residence at the University for at least one semester, on the basis of a competitive exa ination held in December in years when funds are adequate for at least two scholarshi

**Dunlap Harrington Memorial Fund.** Established in memory of Dunlap Harringto by his brother, this fund provides an award of $50 to a male senior in his final semest who is financially unable to take part in the special events of that semester.

**Illini War Memorial Scholarships.** Scholarships in varying amounts are made ava able by the University of Illinois Foundation from gifts to the Illini Achievement Fun

**Latin Contest Scholarships.** The winner of the annual Latin contest sponsored by t Illinois Classical Conference receives exemption from the tuition fee for one year.

**Morava Scholarships.** These scholarships are made available under the will Wensel Morava. They are awarded annually in varying amounts.

**La Verne Noyes Scholarships.** Made available under the will of La Verne Noy these scholarships cover part of student fees for one year. They are open to students w served in the Army or Navy of the United States of America in World War I, or descendants of active participants in that war.

**John C. Ruettinger Memorial Scholarship Fund.** This scholarship was established Mr. John W. Ruettinger, of Chicago, an alumnus of the University of the class of 19 in memory of his father. It provides annually tuition and other educational expenses one or more worthy and needy undergraduate students.

**Phyllis Pierce Ruettinger Scholarship.** This scholarship was established in mem of Phyllis Pierce Ruettinger by her mother. Awards are made annually to junior or sen women registered at the University of Illinois, on the basis of character, scholarsh general ability, and financial need.

**John T. Rusher Scholarship Fund.** Floyd E. Rusher and Dorette J. Rusher of Peoria, Illinois, have established a trust fund in memory of their son, John T. Rusher, who died while in the service of his country. The income from this fund is used for scholarships. Awards are made on the basis of scholastic promise, character, and financial need. Other qualifications being equal, preference is given to students from Peoria or Tazewell County.

**Linsley F. Ter Bush Memorial Scholarship Fund.** The income from this fund, established by a bequest in the will of the late Mrs. Louise M. Leopold, is used for scholarships.

**University and Science Talent Scholarships.** The Board of Trustees has established for each year twelve scholarships open to residents of Illinois and known as University Scholarships. Two of these scholarships are designated for students recommended by the Illinois State Academy of Science. These University Scholarships exempt holders from the tuition fees as required in those colleges of the University which admit students directly from high schools. A scholarship may be lapsed or forfeited if the holder fails to maintain a satisfactory record, is dismissed by the University authorities, or ceases to be a resident of Illinois.

**Manierre Barlow Ware Scholarships.** The income from a gift to the University made in memory of Manierre Barlow Ware by his mother is awarded annually to male students preferably in the College of Agriculture who are not otherwise able to provide funds for their education. The scholarships may be awarded to male students who are enrolled in or who seek to enroll in other undergraduate divisions of the University, if in the judgment of the University this is desirable.

**Wright Scholarships.** Undergraduate scholarships are made available by the gift of Harry G. and Harriette A. Wright. Awards are made to residents of Illinois on the basis of scholarship, character, and financial need. Other qualifications being equal, preference is given to applicants who express a desire and intention to prepare for work in agriculture or in fields closely related to agriculture and to applicants who reside in De Kalb, Randolph, Lee, or Whiteside County. The value of each undergraduate scholarship is $400 a year plus fees.

## SCHOLARSHIPS AVAILABLE IN CERTAIN COURSES

**Air Foundation Scholarships.** Through a gift from the Air Foundation of Cleveland, four scholarships of $250 each are awarded to students in aeronautical engineering to cover the fee for a one-semester course in flight training. Awards are made on recommendation of the Department of Aeronautical Engineering.

**Borden Agricultural Scholarship Award.** The Borden Company Foundation has established a fund from which one $300 scholarship is awarded annually to a student in the College of Agriculture who at the beginning of his senior year has achieved the highest scholarship average and who has completed two or more courses in dairy science.

**Borden Home Economics Scholarship Award.** The Borden Company Foundation has established a fund from which one $300 scholarship is awarded annually to a student majoring in home economics who upon entering her senior year has achieved the highest scholarship average and who has completed two or more courses in foods and nutrition.

**Chicago Farmers Scholarship in Agriculture.** One scholarship of $500 each year is awarded to a junior in agriculture for use during his senior year. The award is made by the Committee on Special Undergraduate Scholarships on recommendation of the scholarship committee of the College of Agriculture.

**Illinois Rural Youth Community Service Scholarships in Agriculture and Home Economics.** From funds given by the Gulf, Mobile, and Ohio Railroad Company, seven scholarships in agriculture and home economics are awarded each year to students living in the thirty counties served by this railroad that have had the best programs on Rural Youth Community Service during the past year. The scholarships range in value from $250 to $400. Applications may be filed with the Dean of the College of Agriculture. All applications must be approved by the County Farm Adviser and must be accompanied by a thousand-word essay on "The Railroad Industry." Awards are made by the Committee on Special Undergraduate Scholarships on recommendation of the Dean of the College of Agriculture.

**Kroger Scholarships in Agriculture and Home Economics.** Through a gift from the Kroger Grocery Company three scholarships in agriculture and three in home economics are awarded each year to freshmen by the Committee on Special Undergraduate Scholar-

ships on recommendation of the scholarship committee of the College of Agriculture These scholarships have a value of $200 each.

**Lincoln Arc-Welding Scholarship in Agricultural Engineering.** A fund from the Lincoln Arc-Welding Foundation provides for several awards of $250 each. On the basi of scholarship, activities, and personal characteristics, one award is made each yea to a junior majoring in agricultural engineering.

**Sears-Roebuck Scholarships in Agriculture and Home Economics.** A fund to ai freshman and sophomore students in the College of Agriculture has been made availabl through a gift of the Sears-Roebuck Foundation. Awards are made to students whos high school and other records show promise of superior attainment and who nee financial assistance. Applications are filed in the Office of the Dean of the College o Agriculture. An award to a freshman is normally $200 for the first year.

**United Spanish War Veterans Auxiliary Scholarship in Home Economics.** Fifty dol lars annually is awarded to a student in home economics at the end of the freshman yea on recommendation of the Department of Home Economics on the basis of scholarshi qualities of leadership, and financial need.

**Ceramic Scholarships.** Ten two-year scholarships, covering the tuition fee, are avail able each year. These scholarships are financed by industry through the Ceramic Schola ship Trust Fund. Awards are made by the Committee on Special Undergraduat Scholarships. Recommendations of the Department of Ceramic Engineering are con sidered in selecting the candidates.

**Illuminating Engineering Scholarships.** Two scholarships of $250 each per year ar made available by a gift of the Illuminating Engineering Society (Chicago Section) One scholarship is awarded to a junior and one to a senior in the illuminating engineerin option of electrical engineering. The awards are made by the Committee on Specia Undergraduate Scholarships on the recommendation of the teaching staff in illuminatin engineering. A candidate must be a citizen of the United States, must have complete one full semester in the University with a superior scholarship record, and must giv promise of being successful in his chosen profession.

**Frederick D. Secor Memorial Scholarships in Electrical Engineering.** A bequest i the will of the late Bessie Secor, in memory of her father, provides scholarships for stu dents in electrical engineering.

**Ceco Steel Products Corporation Scholarships in Engineering.** Two scholarship are available for superior, worthy and needy students in civil or general engineering Each scholarship is $500 for the junior and $500 for the senior year subject to satisfac tory scholarship record. Awards are made by the Committee on Special Undergraduat Scholarships on recommendation of a committee appointed by the Dean of the Colleg of Engineering.

**John Morse Memorial Scholarships in Engineering.** Three scholarships for junior and three for seniors are awarded from funds given by the John Morse Memorial Founda tion. Each scholarship is $500 a year. First preference is given to students in mechanica engineering and second preference to students in electrical engineering. Awards are mad by the Trustees of the Foundation on recommendation of the College of Engineering an the Committee on Special Undergraduate Scholarships.

**Mining Engineering Scholarships.** Funds have been received from various donors t provide scholarships for students in mining engineering. These scholarships are awarde by the Committee on Special Undergraduate Scholarships on the recommendation of th Department of Mining and Metallurgical Engineering. In certain instances, preference given to employees or children of employees of the donor. These scholarships have value of $200 a year. Funds have been received from the Illinois Mining Institute, Ol Ben Coal Company, Peabody Coal Company, and Sahara Coal Company. Sahara Co Company scholarships are also available for graduate study in mining engineering.

**Alfred E. Pickard Scholarship in Engineering.** This scholarship, worth $200, awarded to a worthy student in the College of Engineering, preferably a student in min ing engineering, who needs financial aid. The award is made by the Committee o Special Undergraduate Scholarships on recommendation of the Department of Minin and Metallurgical Engineering.

**Skidmore, Owings, and Merrill Scholarship in Architecture.** From funds provide by the architectural firm of Skidmore, Owings, and Merrill, one scholarship of $1,000 awarded to an outstanding student in architecture who is about to begin his final year

undergraduate study. The award is made by the Committee on Special Undergraduate Scholarships on recommendation of a Committee in the Department of Architecture.

**Lydia E. Parker Bates Scholarships in Fine Arts.** Available in varying amounts to undergraduate and graduate students in art, architecture, architectural engineering, and landscape architecture. Awarded on recommendation of a committee of the faculty of the College of Fine and Applied Arts.

**Journalism Alumni Memorial Scholarship.** Fifty dollars annually is awarded to a junior in the School of Journalism and Communications, payable at the beginning of his senior year. The award is made on recommendation of the faculty of the School of Journalism and Communications on the basis of scholarship, character, aptitude in journalism, and other related qualities.

**William Anderson Scholarships in Music.** The income from a gift by Mrs. Margaret Anderson, in memory of her late husband, provides scholarships for needy and talented students registered in the School of Music. The awards are made by the Committee on Special Undergraduate Scholarships on recommendation of a committee of the faculty of the School of Music.

**Sinai Temple of Champaign-Urbana Scholarship in Music.** A scholarship of $50 was established in 1943 by the Sinai Temple of Champaign-Urbana. It is awarded annually, on recommendation of a faculty committee of the School of Music, to an upperclass student in music, on the basis of scholastic excellence, natural ability, and financial need.

**Thomas J. Smith Scholarships in Music.** Four scholarships are available annually for women, preferably from Champaign County. These are awarded to students who are unable to pay the customary fees for instruction in music, on the basis of comparative promise as judged by a committee of the School of Music.

**Illinois Federation of Women's Clubs Scholarships in Occupational Therapy.** Through the gifts of the state organization and the third congressional district of the Illinois Federation of Women's Clubs, funds are available for a limited number of scholarships for properly qualified and deserving students in occupational therapy.

**Lois Shepherd Green Scholarships in Philosophy.** A scholarship fund has been established by Frederick Green, Professor of Law, Emeritus, in memory of his wife. The income is to be used for scholarships to undergraduate students on recommendation of the faculty of the Department of Philosophy.

**Lou Boudreau Scholarships.** Through the Lou Boudreau Trust Fund, scholarships covering tuition and fees have been established and are available to male graduates of Thornton Township High School who rank in the upper 50 per cent of their class. Candidates must be outstanding in one or more extracurricular activity, and must possess qualities of leadership, good character, and good habits. Awards are made by the Committee on Special Undergraduate Scholarships from candidates recommended by the local committee.

**Robert C. Zuppke Scholarships in Physical Education.** Through a gift two scholarships have been established for male students in the general curriculum in physical education who are residents of Illinois. Each scholarship covers tuition and fees for four years. Awards are made by the Committee on Special Undergraduate Scholarships on recommendation of the executive committee of the School of Physical Education.

**Illinois Congress of Parents and Teachers Scholarships.** Three scholarships each year, of a value of $200 each, are made available by the Illinois Congress of Parents and Teachers. Applicants must be graduates of Illinois high schools maintaining local units of the Illinois Congress of Parents and Teachers and must be preparing to teach. The Congress has also given funds for scholarships for students preparing to teach deaf or mentally handicapped children.

**LOAN FUNDS.** The following loan funds have been established for the benefit of worthy students of the University who are in need of financial aid. Loans are not ordinarily made to students during their first year at the University. Each application must be approved by the dean, director, or

assistant dean of the college or school in which the student is registered, by the Dean of Students, the Dean of Men, or the Dean of Women, and by the Comptroller; in case of disagreement among these officers the application will be submitted to the Chairman of the Finance Committee of the Board of Trustees. Security in the form of a qualified endorser or collateral satisfactory to the Comptroller is required for all long-term loans unless otherwise provided in the deed of gift of the fund or waived in meritorious cases, as determined by the Dean of Men or the Dean of Women and the Comptroller. Application blanks may be obtained from the offices of the Bursar, the Dean of Men, and the Dean of Women.

**Dora E. Biddle Loan Fund for Girls.** This fund was derived in 1919-1920 from two gifts by Mrs. Dora E. Biddle of Macon, Illinois. Preference is given those women students most advanced in their University work.

**Carter-Pennell Loan Fund.** Donated by the late Joseph Carter and his wife, Jane Pennell Carter, in 1923. Loans may be made to any student of sophomore standing in the Colleges of Engineering and Agriculture, or to any student in the College of Liberal Arts and Sciences who is specializing in science.

**Champaign Business and Professional Women's Club Loan Fund.** Presented to the University on October 8, 1940. Loans from this fund are made to deserving women students.

**Chicago Illinae Club Fund.** Established by the Chicago Illinae Club especially for women students of the University.

**Raymond Clamage Memorial Fund.** Presented August 5, 1947, by Mr. and Mrs. Edward Clamage as a memorial to their son, Lieutenant Raymond Clamage. Loans may be made only to students on the *Daily Illini* staff.

**Class of 1907 Loan Fund.** Presented to the University on June 11, 1932, this fund is used for the making of loans to students under general rules of the Board of Trustees governing loan funds, with no restrictions except that preference be shown to lineal descendants of members of the class.

**Consolidated Loan Fund.** This fund results from the merger of the Automobile Show Fund, the Class of 1895 Loan Fund, the Graduate Club Loan Fund, and the Student Friendship Fund.

**Grace Darling Memorial Fund.** Founded by Mrs. R. V. Cram, of Minneapolis, in 1922. Operated under the regulations of the Edward Snyder Fund described below.

**Louis Edward Dawson Memorial Fund.** A gift from Mrs. Edward Dawson, accepted November 23, 1945, as a memorial to her son, Louis Edward Dawson. The fund is used to aid worthy students in chemistry.

**Denison Memorial Fund for Worthy Seniors.** The late Charles A. Denison, of Argenta, bequeathed this fund to be used for loans to worthy senior students on recommendation of the President and Treasurer of the University.

**Detroit Illinae Club Loan Fund.** Established May 11, 1932, as a gift from the Detroit Illinae Club.

**Harry J. Diffenbaugh Trust Fund.** The late Harry J. Diffenbaugh, of the Class of 1882, established a trust fund, the income of which is used for loans to worthy and needy students who are residents of the state of Missouri attending the University of Illinois. Applications for loans may be made to the Dean of Men of the University of Illinois or to the First National Bank of Kansas City, Missouri, the administrators of the trust fund.

**Electrical Engineering Loan Fund.** Established by the Electrical Engineering Society and maintained by the Student Branch of the American Institute of Electrical Engineers, this fund includes income from the electrical shows and is available for juniors and seniors in good standing in the curricula in electrical engineering and engineering physics.

**Engineering Student Loan Fund.** The residual assets of the Real Co-operative Con

pany (formerly the Engineering Co-operative Society) were accepted by the University in 1936 for the purpose of establishing a loan fund for the benefit of students in the College of Engineering.

**James Wilford Garner Memorial Fund.** Presented to the University June 24, 1941, this fund is used for loans to worthy students in political science.

**Samuel and Lydia Hare Student Loan Fund.** The late Samuel Hare, of Piper City, bequeathed this fund (accepted by the Board of Trustees, October 15, 1937) for loans to students who, by previous study, have demonstrated their worthiness.

**Mary Trowbridge Honey Loan Fund.** A bequest of the late Mary Trowbridge Honey, of Wayne, Nebraska, accepted by the Board of Trustees May 16, 1942, for loans to students in the Department of Classics.

**Margaret Lange James Student Loan Fund.** Established by a gift from President E. J. James in 1914 and increased by the University Senate as a memorial to him. Loans may be made to students, preferably women, who have been in residence at least one year, have attained junior standing, and expect to graduate.

**A. F. Kaeser Student Loan Fund.** A gift from Dr. A. F. Kaeser, of Highland, Illinois, accepted on September 30, 1939, by the Board of Trustees. Graduates of high schools located in Highland, Illinois, are to be given preferential consideration for loans from this fund. If this loan fund is not exhausted through loans made to these graduates, loans may be made to graduates of high schools located in the counties of Madison, Bond, and Clinton. Loans made to any one student shall not exceed $200 annually or $800 for the four-year period.

**Kappa Delta Pi Student Loan Fund.** Accepted by the Board of Trustees June 15, 1935, as a gift from Alpha Chapter of Kappa Delta Pi. Available only to worthy seniors in the College of Education.

**Willis Prentice Kimble Loan Fund.** A memorial fund established by Mrs. Kimble in 1929. Loans may be made to sophomores, juniors, and seniors, but not in excess of $100 to any one individual.

**William E. Levis Loan Fund.** Established in 1936 by a gift from William E. Levis of the Class of 1913, President of the Owens-Illinois Glass Company. Loans will be made (1) to employees or children of employees of the Owens-Illinois Glass Company and its affiliated companies or subsidiaries, who are students in attendance or prospective students expecting to register immediately at the University; and (2) if funds are available, to students who have been in attendance at the University for at least one year, under the general regulations governing loan funds.

**William B. McKinley Loan Fund.** This fund is made up of several donations made between 1912 and 1926 by the late Senator William B. McKinley. Loans may be made to male students who have been in residence at least one year and intend to graduate.

**J. R. Morris Loan Fund.** Donated by the late Joseph R. Morris, of Anne Arundel County, Maryland, in 1922. Loans may be made to students who have been in residence at least one semester. Preference is given to students who are advanced in University work.

**Loan Fund for Overseas Soldiers.** Originally donated in 1919, with an addition in 1924, this fund is available to soldiers, sailors, and marines with overseas service, and to their descendants. Qualifying students in the junior, senior, or postgraduate years are eligible, or students in any year in the College of Agriculture.

**C. W. Parmelee Fund.** Presented March 11, 1948, by friends of Professor Cullen W. Parmelee, for loans to students in ceramic engineering.

**William T. Rogers Loan Fund.** Established April 10, 1948, by bequest of William T. Rogers, for loans to deserving students in need of financial assistance.

**Marcus Russell Loan Fund.** Donated by the late Marcus Russell, of Los Angeles, California, in 1926. The proceeds from this fund are used as a fund to be loaned to worthy and indigent students.

**Edward Snyder Fund.** This fund was established in 1899 by the late Edward Snyder, Professor of German in the University. Loans may be made to students of junior standing who are in residence and expect to graduate. Preference is given to those of high rank and advanced standing, but no distinction is made as to sex or course of study.

**Henry Strong Educational Foundation.** The Henry Strong Educational Foundation,

established at Chicago under the will of General Henry Strong, provides for loans to students under the age of twenty-five years, preferably in the upper classes.

**St. Louis Illinae Club Loan Fund.** Established March 29, 1937, as a scholarship loan fund.

**Harry Roberts Temple Fund.** Established in 1924 by Mrs. Frieda Block Temple. The regulations of the Edward Snyder Fund apply except that preference is given to students in the Department of Architecture.

**Woman's Athletic Association Loan Fund.** Established September 28, 1932, this fund is available to women students during the senior year.

**Woman's League Fund.** Established by the Woman's League in 1911. This fund is administered under the regulations of the Edward Snyder Fund.

### Emergency Loan Funds

Emergency loan funds are available in small amounts for short periods only. In the Urbana departments the approval of the Dean of Men or Dean of Women and the Comptroller are required. In the Chicago Undergraduate Division, the approval of the Dean of Students is required.

**Cora C. Bright Memorial Loan Fund.** A gift from the Illinois Congress of Parents and Teachers in 1939, for emergency loans to students at Urbana.

**Class of 1932 Fund.** Presented to the University on June 15, 1934, through the Alumni Association, for emergency loans to students at Urbana.

**Verne Hall Detweiler Loan Fund.** A gift from the Illinois Congress of Parents and Teachers in 1936, for emergeny loans to students at Urbana.

**Edward C. Heidrich, Jr. Loan Fund.** Established in 1944 by a gift from Edward C. Heidrich, Jr., this fund is for emergency loans to students at Urbana.

**Thomas L. Seanor Memorial Fund.** This fund was presented November 1, 1945, by Lieutenant Harry F. Seanor as a memorial to his brother, Lieutenant Thomas L. Seanor.

**Irene Symonds Loan Fund.** A gift from the Illinois Congress of Parents and Teachers, accepted November 8, 1943, as a memorial to Irene Symonds. The fund is for emergency loans to students at Urbana.

**Tau Delta Tau Loan Fund.** This fund was presented November 1, 1945, by Tau Delta Tau fraternity as a memorial to two of its members, John Donald Danielson and Joel Hubbard Rossiter.

**University Faculty Emergency Loan Funds for Students.** Established in 1932-1933, these funds represent a portion of the money set aside for emergency loans to students at Urbana from funds solicited in 1931 by the University Senate Committee on Unemployment and Relief.

**PRIZES AND AWARDS.** Competitive prizes, scholarship, fellowships, and miscellaneous awards, which are offered to students in the University, are classified here as follows: (1) those authorized by the Board of Trustees; (2) those awarded by local organizations; and (3) those not limited to students at the University of Illinois, but offered at other schools as well. The following lists are subdivided according to the colleges, schools, or departments conducting the competitions.

### Prizes Authorized by the Board of Trustees

#### GENERAL COMPETITIONS

**Bryan Prize.** In 1898 Mr. William Jennings Bryan gave to the University the sum of $250, from the interest on which a prize of $50 is offered for the best essay on a topic

relating to the science of government. The contest is open to all undergraduate students. The essays may not be less than 3,000 nor more than 6,000 words in length, and they must be left at the office of the Department of Political Science not later than the second Wednesday in May. It is suggested that the essays be on some phase of American government and that contestants confer with the Department of Political Science as to the selection of a topic. The prize is ordinarily offered every fifth year. It will be offered next in 1953.

**English Poetry Prize.** The Department of English offers a prize of $25 for the best undergraduate poem or group of poems of the year. The award may be withheld in any year if no entry is found worthy of a prize.

**Thacher Howland Guild Memorial Prize.** The Department of English offers a prize of $25 for the best undergraduate play of the year. The award may be withheld in any year if no production is found worthy of a prize.

**Thrift Essay Prize.** The income from a fund established in 1918 by the committee for the sale of War Savings Stamps in Illinois is available for prizes for essays on thrift. Any student in the University who has had a course in the principles of economics is eligible to compete. The essays deal with some aspect of thrift, as designated by the Chairman of the Department of Economics, who is in charge of the contest and who announces the conditions of the contest.

### DEPARTMENT OF AIR FORCE SCIENCE AND TACTICS

**Chicago Tribune Awards.** The *Chicago Tribune* awards a gold and a silver medal to the sophomore and freshman doing the most outstanding work for the first semester.

**University Gold Medal.** The Trustees annually provide a gold medal to be awarded to the cadet selected to be Air Force Cadet Colonel for the coming year.

### COLLEGE OF ENGINEERING

**Ira O. Baker Prizes.** The late Dr. Ira O. Baker, Professor of Civil Engineering, Emeritus, endowed two prizes for the two ranking senior students in civil engineering. These awards, amounting to $75 and $25, respectively, are based primarily on excellence of scholarship and secondarily on personal qualities and professional activity. The names of the winners in each year are placed on a bronze tablet located near the office of the Department of Civil Engineering, and a special certificate is given to each winner.

### COLLEGE OF FINE AND APPLIED ARTS

**Allerton American Traveling Scholarships.** For the past several years Mr. Robert Allerton has given the Department of Architecture the sum of $800 to be used during the summer "for a trip through New England by the two juniors who stood best in the junior class in the History of Architecture" for the year. This award enables these students to study early American architecture on the Atlantic seaboard.

**American Institute of Architects Prizes.** The American Institute of Architects awards annually a medal and a book to the senior in architecture whose development during his undergraduate career is the greatest and the most consistent, and a book to the senior in architecture who ranks second.

**Edward C. Earl Prizes.** Income from an endowment bequeathed by the late Edward C. Earl is used for two prizes for students in architecture showing the highest excellence and progress in the courses in materials and methods of construction.

**Grunsfeld European Traveling Fellowship.** An award of $500 toward travel and study in Europe is available to graduates of the curriculum in architecture during the calendar year preceding the award.

**Kate Neal Kinley Memorial Fellowship.** This fellowship was established in 1931 to promote advanced study in the fine arts, in memory of the wife of a former president of the University and in recognition of her influence in promoting these and similar interests. This fellowship enables a graduate of the University, or some similar institution of equal educational standing, to pursue advanced study for one year at home or abroad. This fellowship is not open to students of architectural construction, city planning, or

landscape architecture. The award is made annually under the direction of the Colleg of Fine and Applied Arts.

**Mary C. McLellan Scholarship.** Established by bequest of the late Mary C McLellan of the class of 1888, and accepted by the Board of Trustees in 1942, th scholarship is awarded as funds warrant under the direction of the Department of Ar It is open to graduates of the University who have demonstrated unusual excellence i art and have given promise of professional success. The stipend is to be used for pr fessional development through travel in America or abroad, or for study at a recognize institution or with a qualified private master.

**Plym Fellowships.** The late Francis J. Plym, a graduate of the class of 1897, e dowed two fellowships, one in architecture and the other in architectural engineerin with stipends of $1,700 each. The fellows ordinarily are required to spend six months i study abroad.

**Plym Prizes.** Through endowment by the late Francis J. Plym, the Department Architecture offers annually certain prizes for undergraduate work. The prizes in arch tectural engineering represent three awards to those senior architectural engineers whos work, attitude, and ability are judged the highest. The prize for summer sketches awarded to the student who, during a summer vacation, makes the most interesting an best freehand sketches. The prize for sketch problems is offered to stimulate better d velopment of sketch problems during the year.

**Richard F. Voynow Prize.** Through a gift from Colonel Edward E. Voynow, New York City, a prize of $50 is awarded annually to the student enrolled in the Scho of Music who submits the best essay on a subject selected by the Director of the School Music, preference to be given to a subject dealing with some phase of modern popul music.

**James M. White Memorial Prize.** Income from the James M. White Memorial Fun is used for a prize for the graduate student in architecture who shows the highest e cellence in graduate studies.

### COLLEGE OF LAW

**Harker Prizes.** The late Judge O. A. Harker, Professor of Law, Emeritus, who wa Dean of the College of Law from 1903 to 1916 and again in 1920-1921, endowed tw annual prizes: the annual income on $2,000 to the senior making the highest averag grade in law subjects for the three years in which he was registered; and the annual in come on $1,000 to the junior making the highest average grade in law subjects for th two years in which he was registered.

### DEPARTMENT OF MILITARY SCIENCE AND TACTICS

**Chicago Tribune Awards.** The *Chicago Tribune* awards a gold and a silver meda each semester to the two sophomores most outstanding scholastically. The cadet with a "A" in military science and the highest academic average for the semester will be de clared the winner of the gold medal, and the student second highest, the winner of th silver medal. In case of ties, the one with the highest numerical grade in military scienc for the semester will be the winner. If this does not break the tie, previous semeste averages will be considered, and the one with the highest cumulative academic averag will be the winner. If this does not break the tie, they will be declared co-winners, an the medal awarded by lot.

**Hazelton Medal.** In 1890 Captain W. C. Hazelton provided a medal which i awarded to the best-drilled freshman in the basic course. Each competitor must hav been in attendance at the University at least sixteen weeks of the current college yea and have had not more than one unexcused absence from drill. To be eligible for thi award, a student must have a grade of "B" in military science and he must have a academic average of not lower than "C" in his first semester courses. Competition i normally held in March and April. The successful competitor retains possession of th medal until the date of the final competition of the following year.

**University Gold Medal.** The Trustees annually provide a gold medal to be awarde to the best-drilled second-year basic course student. To be eligible for this award, student must have completed three semesters of work in military science with a grad

ot lower than "B"; and he must have an average standing not lower than "C" in all his her studies for the preceding semester. Competition is normally held in March and pril.

#### DEPARTMENT OF NAVAL SCIENCE

**University Gold Medal.** The Trustees present a gold medal to the Midshipman of e graduating class with the highest grade-point average for seven semesters of Naval ience.

**Chicago Tribune Awards for Merit.** Each semester one gold medal and one silver dal are presented by the *Chicago Tribune* to outstanding N.R.O.T.C. Midshipmen. The ards are based on military achievement, scholastic atttainment, and character.

## Prizes Awarded by Organizations at the University

#### GENERAL COMPETITIONS

**Alpha Lambda Delta Prize.** The national organization of Alpha Lambda Delta, nor society for freshman women, offers annually a book to the senior woman who in r freshman year was elected to Alpha Lambda Delta and who has maintained the ghest scholastic average of the Alpha Lambda Delta graduating seniors.

**Chi Omega Prize.** The University of Illinois chapter of Chi Omega offers annually orize of $25 to the senior woman who has consistently done the most outstanding work the field of sociology.

**Thomas Arkle Clark Prize.** The freshman honor society, Phi Eta Sigma, gives each ar a prize of $25 to the sophomore member of Phi Eta Sigma who has attained the ghest scholastic average for his first three semesters in the University. This prize is arded as soon as possible after the grades are available for the first semester. In case o men have the same average, other factors are considered, such as extracurricular tivities and outside work.

**Phi Kappa Phi Awards.** The local chapter of Phi Kappa Phi, national honor society, es two or more awards annually for graduate study to members of the local chapter o are graduates of the University or members of the graduating class. The students selected on the basis of scholastic record and promise of success in graduate work. Aplications should be addressed to the local secretary of the society early in the second mester.

#### COLLEGE OF AGRICULTURE

**Alpha Zeta Award.** Each year the name of the freshman in the College of Agricul- e who makes the highest grade average for both semesters is inscribed on the Alpha Z plaque.

**Gamma Sigma Delta Prize.** Each year the senior in the College of Agriculture who ks highest in scholarship, on the basis of a minimum of four semesters of work in idence in the University, has his name inscribed on the Gamma Sigma Delta plaque the Agriculture Library.

**Home Economics Club Award.** Each year the name of the freshman in home eco- mics who makes the highest average is engraved on a plaque provided by the Home Economics Club.

**Omicron Nu Plaque.** Each year the name of the senior in home economics who ks highest in scholarship is inscribed on the Omicron Nu plaque which hangs in Bevier Hall.

#### DEPARTMENT OF AIR FORCE SCIENCE AND TACTICS

**Air Force Association Award.** A medal is presented to the outstanding first-year anced course cadet in the Air Force R.O.T.C.

**American Legion Awards.** The Illinois Department of the American Legion awards

a medal to the senior Air Force cadet who has maintained the highest military avera in each of the following options: maintenance, administration and logistics, flight ope ations, general technical.

**American Legion Auxiliary Awards.** The Illinois Department of the American Legi Auxiliary makes an award of $50 to the retiring Air Force Cadet Colonel.

Unit No. 24 presents a $25 bond to the best-drilled first-year cadet.

Unit No. 71 presents a $25 bond to the best-drilled second-year cadet.

**Arnold Air Society Trophy.** The Arnold Air Society presents a trophy to the i coming Commander of the Arnold Air Society.

**Daughters of the American Revolution Prize.** The Daughters of the American Rev lution presents a ring to the member of the Air Force rifle team who has be most active during the preceding year.

**Daughters of Union Veterans of the Civil War Award.** The Department of Illino Daughters of Union Veterans of the Civil War, presents a medal to the advanced cou Air Force cadet who was most active in Pershing Rifles during the past year.

**Scabbard and Blade Award.** A medal is presented to the outstanding second-ye member of Scabbard and Blade in the Air Force R.O.T.C.

**Veterans of Foreign Wars of the United States Awards.** The Illinois Departme of the Veterans of Foreign Wars of the United States awards a watch to the cadet m active in the Arnold Society.

Silver citizenship medals are awarded to the incoming and retiring Cadet Wi Executive Officers.

**Veterans of Foreign Wars of the United States Auxiliary Award.** A medal and $25 bond are awarded to the cadet placing second for the selection of colonel for t coming year.

**Woman's Relief Corps Tablet.** The names of the senior cadets of the Air For Army, and Navy R.O.T.C. who have excelled in scholarship are inscribed on a milit bronze tablet.

### COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION

**Alpha Kappa Psi Scholarship Medallion.** Epsilon Chapter of Alpha Kappa Psi professional fraternity in commerce, awards annually a scholarship medallion to the m student pursuing a curriculum in the College of Commerce and Business Administrat who has attained the highest scholastic average for three years of collegiate work in t University. The name of the winner is engraved on a scholarship tablet on display the college office.

**Delta Sigma Pi Key.** The Illinois chapter of Delta Sigma Pi, professional fraterni annually awards a key to the male student graduating from the College of Commerce a Business Administration with the highest four-year scholastic average.

**Phi Chi Theta Key.** The professional sorority, Phi Chi Theta, awards a key e year to the woman in the junior class in the College of Commerce and Business Admi tration who ranks highest in the estimation of a committee composed of three memb of the faculty and one member of the sorority. Scholastic records, extracurricular tivities, and promise of success in business are considered.

### COLLEGE OF EDUCATION

**Kappa Delta Pi Award.** Alpha Chapter of Kappa Delta Pi offers anually an aw of $10 to an outstanding senior in the College of Education. The award is granted t student of high character who has exhibited unusual proficiency in practice teaching who has attained superior scholarship in his field of specialization and high scholars in all his University work. The name of the recipient is engraved on a plaque hung the office of the Dean of the College of Education.

### COLLEGE OF ENGINEERING

**American Society of Civil Engineers Awards.** Junior membership for one year the American Society of Civil Engineers, including the badge of the society and

embossed certificate of award, is presented each year by the Illinois Section of the society to one graduating civil engineer and by the Central Illinois Section to two graduating civil engineers and to one graduating non-civil engineer who have attained high scholarship averages and who have been active in promoting the affairs of the student chapter at the University.

**American Society of Mechanical Engineers Awards.** The Central Illinois Section of the society awards two prizes of $10 and $15 annually for the best papers prepared by senior student members of the society at Urbana.

### COLLEGE OF FINE AND APPLIED ARTS

**Alpha Rho Chi Medal.** Alpha Rho Chi, national architectural fraternity, provides a bronze medal each year to the Department of Architecture, to be awarded to a senior who has shown ability for leadership and given promise of professional merit.

**Ricker Prize.** Gold keys are awarded annually for the three best essays on some phase of the history of architecture by students registered in the second year of work in this subject. This prize is given by Anthemios Chapter of Alpha Rho Chi in recognition of the distinguished contributions made by the late Dr. Nathan Clifford Ricker, who for fifty years taught the history of architecture in the University.

**Scarab Medals.** Scarab, architectural fraternity, offers annually several bronze medals as follows: (1) for freehand sketching open to all students in architecture; (2) for outstanding work in freshman architectural design; (3) for the best solution of the first major second-semester problem in sophomore design; (4) for the highest award on the second major second-semester problem in junior design; (5) to the student in architectural engineering with the highest record made in freshman and sophomore design.

**Pi Kappa Lambda Award.** The initiation fees of Pi Kappa Lambda, national honorary music fraternity, are awarded annually to the senior student in music who has the highest scholastic average.

### SCHOOL OF JOURNALISM AND COMMUNICATIONS

**Alpha Delta Sigma Plaque.** Alpha Delta Sigma, national professional advertising fraternity, selects and recognizes the oustanding junior in the School of Journalism and Communications each year. The selectee's name is engraved on a wall plaque for permanent display in Gregory Hall.

**Illinois Press Association Award.** A prize of $100 is awarded each year to the School of Journalism and Communications outstanding senior, man or woman, who plans to enter the community newspaper field.

**St. Louis Advertising Club Award.** An all-expense trip to St. Louis, Missouri, for one week is awarded to two seniors in advertising, one man and one woman, as guests of the St. Louis Advertising Club. Selection is by the faculty of the School of Journalism and Communications as a recognition of achievement and promise in the profession of advertising.

**Sigma Delta Chi Certificates.** Each year the national journalism fraternity, Sigma Delta Chi, awards certificates to the upper 10 per cent of the graduating class in the School of Journalism and Communications. Also a special citation of achievement is awarded to the outstanding man in the class, selected on a basis of scholarship, character, and journalistic competence. His name is engraved on a wall plaque for permanent display in Gregory Hall.

**Theta Sigma Phi Award.** The outstanding woman in the graduating class is selected each year by Theta Sigma Phi, woman's professional journalism fraternity, and is awarded a certificate of achievement. Her name is engraved on a wall plaque for permanent display in Gregory Hall.

### COLLEGE OF LAW

**Frederick Green Moot-Court Competition Award.** The Horner Chapter of Nu Beta Epsilon, law fraternity, has presented to the University a gold cup on which is inscribed each year the name of the student in the College of Law who places first in the Frederick Green Moot-Court Competition.

### COLLEGE OF LIBERAL ARTS AND SCIENCES

**Alpha Chi Sigma Plaque.** Zeta Chapter of Alpha Chi Sigma, chemical professional fraternity, has hung a plaque in the Chemistry Library as an award for high scholarship in the freshman class. Each year the name of the man who attains the highest scholastic average for his first semester of work in the curriculum of chemistry or chemical engineering is engraved on the plaque.

**Iota Sigma Pi Prize.** A cash prize of $20 is awarded each year by the honorary chemical sorority, Iota Sigma Pi, to the woman in the senior class who has the highest scholastic average in her University work with chemistry as her major subject.

**Omega Beta Pi Scholarship Award and Trophy.** A cash prize of $25 is awarded each year by the honorary premedical fraternity, Omega Beta Pi, to the student who has shown the highest excellence in the physical sciences during his first three semesters in the premedical curriculum. Omega Beta Pi also awards a trophy at the end of the first semester each year to the freshman premedical student making the highest scholastic average.

**Phi Beta Kappa Scholarship.** The University of Illinois chapter of Phi Beta Kappa awards a scholarship of $100 annually to a member of the junior class of the College of Liberal Arts and Sciences, selected on the basis of general merit. The scholarship is available to the winner during his senior year at the University of Illinois.

**Phi Lambda Upsilon Cup.** Alpha Chapter of Phi Lambda Upsilon, honorary chemical society, awards a cup annually to the sophomore man who has the highest scholastic average among the students in the curricula of chemistry and chemical engineering. The cup is on display in the main hall of the Chemistry Annex.

**Phi Sigma Medal.** The national organization of Phi Sigma, honorary biological society, awards annually a silver medal to the undergraduate student presenting the best report or evidence of the most original research on a biological subject.

**Doctor Abram Leon Sachar Prize.** This prize is made available through an annual gift of $100 from the Women's District Grand Lodge Number Six B'nai B'rith. The prize is awarded by the Department of History to the senior who has the highest scholastic average among graduating seniors who have majored in history.

### DEPARTMENT OF MILITARY SCIENCE AND TACTICS

**American Legion Medals.** The American Legion, Department of Illinois, awards medals to the retiring S-1, S-2, S-3, and S-4 of the Brigade Staff for superior attainment.

**American Legion Auxiliary Awards.** The Illinois Department of the American Legion Auxiliary makes an award of $50 to the member of the R.O.T.C. Rifle Team who consistently has been the best marksman and an award of $50 to the retiring Brigade Executive Officer of the Army R.O.T.C.

Unit No. 24 presents an award of $25 to the runner-up in the competition for the Hazelton Medal.

Unit No. 71 presents an award of $25 to the runner-up in the competition for the University Gold Medal.

**Armed Forces Communication Association Award.** A medal is presented to the outstanding sophomore, junior, and senior cadet in the Signal Corps Unit who is majoring in communications and electronics.

**Armor Unit Medal.** The best-drilled Basic Course cadet in the Armor Unit receives a medal.

**Association of United States Army.** A medal is presented to the outstanding senior Infantry cadet.

**Coast Artillery Association Medal.** A medal is given to the outstanding senior Antiaircraft Artillery cadet.

**Daughters of the American Revolution Prize.** A saber is presented to the new Cadet Colonel for superior attainment.

**Daughters of Union Veterans of the Civil War Medal.** A medal is awarded by the Daughters of Union Veterans of the Civil War, Department of Illinois, to the outstanding advanced course member of the Rifle Team who has contributed most toward the promotion of rifle marksmanship at the University of Illinois.

**Fifth Army Awards.** Medals and plaques are presented to the ten highest members of the Rifle Team winning first place in the Fifth Army Area Senior R.O.T.C. Intercollegiate Rifle Match.

**National Defense Transportation Association Prizes.** The Association presents a scroll citation and a gold-filled key and chain to the outstanding senior Transportation Corps cadet. The most outstanding junior Transportation Corps cadet is given a scroll citation.

**Ordnance Association Medal.** The outstanding junior Ordnance cadet is presented with a medal.

**Phalanx Awards.** This organization awards to the outstanding freshman of each branch a plaque and bars for general excellence.

**Quartermaster Association Awards.** A key is presented to the outstanding senior Quartermaster cadet and a medal to the outstanding junior Quartermaster cadet.

**Reserve Officers' Association Medal.** The Champaign County Chapter of the Reserve Officers' Association presents an award to the retiring Cadet Colonel for superior attainment.

**Scabbard and Blade Prizes.** Bars are presented to the outstanding sophomore in each regiment for general excellence.

**Society of American Military Engineers Medal.** The Society presents a medal to the most outstanding Engineer cadet with one year remaining before graduation.

**Sons of Union Veterans of the Civil War Prize.** A saber is presented to the second-year advanced R.O.T.C. cadet, exclusive of brigade commander, regimental commanders and their staffs, who was most active in military work during his four years in college.

**Sons of Union Veterans of the Civil War Auxiliary Prize.** A saber is presented to the most outstanding Battalion Commander of the Army R.O.T.C.

**Veterans of Foreign Wars of the United States Awards.** A watch, a silver medal, and a certificate of merit are presented to the outstanding Regimental Commander of the Army R.O.T.C.; a silver medal and a certificate of merit are presented to the other two Regimental Commanders.

**Veterans of Foreign Wars of the United States Auxiliary Award.** The award of the Pershing Rifles medal and a $25 government bond is made to the outstanding sophomore in Pershing Rifles.

**Woman's Relief Corps Tablet.** The Illinois Department of the Woman's Relief Corps presents a tablet to the eighteen senior cadets outstanding in military excellence.

### DEPARTMENT OF NAVAL SCIENCE

**American Legion Medals.** Medals are awarded by the American Legion, Department of Illinois, to outstanding Midshipmen of the freshman and sophomore classes.

**American Legion Auxiliary Award.** Auxiliary Unit No. 24 of Champaign presents $25 to the Midshipman of the junior class who has the highest grade-point average for five semesters in the University.

**The Commandant's Cup.** The Commandant's Cup is presented by the Professor of Naval Science to the best-drilled platoon in the Naval R.O.T.C. for the academic year.

**Daughters of the American Revolution Prize.** A camera is presented to the Midshipman of the graduating class who has contributed most by his officer-like qualities and positive character to the development of naval spirit and loyalty within the Naval Battalion.

**Director of Training's Cup.** The Professor of Naval Science presents the Director of Training's Cup to the most improved platoon in the Naval R.O.T.C. for the academic year.

**Professor of Naval Science Cup.** This cup is presented to the Midshipman who has excelled in the course in navigation.

**Veterans of Foreign Wars of the United States Award.** A watch, a silver citizenship medal, and a certificate of merit are given to the Midshipman who has demonstrated outstanding qualities of naval leadership.

**Veterans of Foreign Wars of the United States Auxiliary Award.** To the Midship-

man who has contributed most to the high morale and spirit of the N.R.O.T.C. Battalion by his conscientious endeavor in the extracurricular activities of the University is awarded a medal and $25 government bond.

**Woman's Relief Corps Tablet.** The Illinois Department of the Woman's Relief Corps presents a tablet to senior cadets and midshipmen of the Army, Navy, and Air Force R.O.T.C. who have excelled in military scholarship.

#### SCHOOL OF PHYSICAL EDUCATION

**Delta Theta Epsilon Award.** A trophy is awarded annually by Delta Theta Epsilon honorary physical education fraternity, to a senior in the curriculum in physical education for men. Character, scholarship, personality, and ability as a teacher are considered by the faculty committee in making the award.

## Prizes Not Limited to the University of Illinois

#### GENERAL COMPETITIONS

**Intercollegiate Conference Medal.** The Intercollegiate Conference, through its faculty representative of each conference institution, awards annually a medal to the student of the graduating class who has attained the greatest proficiency in athletics and in scholastic work.

**Phi Kappa Phi (Sparks Memorial) Fellowship.** Six fellowships of $1,200 each, for graduate study in any American institution of recognized standing, are awarded annually by Phi Kappa Phi, national honor society, in competitions open to members of the society in any American college or university where a chapter of the society exists. The recipients are selected by a national board from candidates recommended by the local chapters. Prospective candidates should file their applications with the local secretary of the society early in the second semester.

#### COLLEGE OF ENGINEERING

**American Institute of Mining and Metallurgical Engineers' Student Technical Paper Writing Contest.** Competition is open to all student associates of the Institute, both undergraduate and graduate. The Chicago Section offers cash prizes of $100 and $50, and books for the best papers among colleges in this section. The best papers from local sections throughout the country are judged for national prizes.

**American Society of Mechanical Engineers Prize.** This society offers annually five prizes of $10 to $50 for the best papers prepared by senior student members of the society as judged in sectional competitions. This society also offers an annual prize of $25 to the student preparing the best paper on a selected topic in a nationally conducted competition.

**Highway Prize.** The Illinois Association of County Superintendents of Highways gives an annual prize of $25 for the best paper written by a senior in civil engineering on a subject in the highway field, such as design, construction, or maintenance. This is given with the understanding that the winning paper will be presented at the Annual Highway Conference.

**John Smeaton Award.** The Illinois Concrete Pipe Association gives an annual prize of $25 for the best paper written by a senior in the College of Engineering on the manufacture of concrete pipe.

**Tau Beta Pi Fellowship.** Six fellowships of approximately $650 each, for graduate study in any engineering college of recognized standing are awarded annually by Tau Beta Pi, national engineering honor society, in competitions open to members of the organization in any American college or university where a chapter of Tau Beta Pi exists. The recipients are selected by a national board from candidates recommended by the local chapters. Prospective candidates should file their applications with the chairman of the board prior to March 1.

## COLLEGE OF FINE AND APPLIED ARTS

**American Academy in Rome Fellowships in Architecture and Landscape Architecture.** In annual competitions open to qualified undergraduates and graduates of certain American schools, the American Academy in Rome usually awards two fellowships: (1) the Fellowship in Architecture, which provides two years of residence and travel abroad for the study of classic and Renaissance architecture; and (2) the Fellowship in Landscape Architecture, which provides a three-year term of study in landscape architecture at Rome. Since 1942, the Academy has offered cash prizes in lieu of foreign fellowships.

**American Society of Landscape Architects Certifiate.** A certificate of merit is awarded each year to a graduating senior in each of the ten schools on the accredited list of the American Society of Landscape Architects. In nominating candidates for this award, the faculty considers scholarship, character, ability, and attainment.

**Paris Prize.** The Society of Beaux Arts Architects offers an annual award known as the Paris Prize, competition for which is open to qualified students of certain American schools, including the University of Illinois. This prize provides one year of study abroad.

**Edward L. Ryerson Traveling Fellowships.** Seniors and graduate students of the University of Illinois are eligible to compete for the Edward L. Ryerson Traveling Fellowships offered each year, one in architecture and one in landscape architecture. Each fellowship grants a stipend to be used for a period of approved study abroad of not less than six months duration.

## DEPARTMENT OF NAVAL SCIENCE

**Society of American Military Engineers N.R.O.T.C. Award.** A gold medal award with key replica is presented to the ten outstanding last-year and ten next-to-last year engineering students in the Naval R.O.T.C. throughout the country.

## COLLEGES AND SCHOOLS

COLLEGE OF AGRICULTURE

INSTITUTE OF AVIATION

COLLEGE OF COMMERCE AND BUSINESS ADMINISTRATION

COLLEGE OF EDUCATION

COLLEGE OF ENGINEERING

COLLEGE OF FINE AND APPLIED ARTS

SCHOOL OF JOURNALISM AND COMMUNICATIONS

COLLEGE OF LAW

COLLEGE OF LIBERAL ARTS AND SCIENCES

LIBRARY SCHOOL

SCHOOL OF PHYSICAL EDUCATION

SCHOOL OF SOCIAL WORK

DIVISION OF SPECIAL SERVICES FOR WAR VETERANS

COLLEGE OF VETERINARY MEDICINE

Mumford Hall, named after Herbert Windsor Mumford, former Dean of the College of Agriculture.

# College of Agriculture

The College of Agriculture prepares men and women for successful careers in agriculture and home economics. It offers many courses in these two fields, which have in common an interest in the production, processing, sale, and use of food and clothing materials, and a direct approach to higher levels of living. Illinois, located in one of the greatest agricultural regions of the world, is in an advantageous position for teaching and research in agriculture and the related industries. While many courses in this college are open to all qualified students in the University, most of the courses are designed primarily for students who desire to follow a four-year curriculum in agriculture or home economics.

There are several four-year curricula leading to the degree of Bachelor of Science, one two-year curriculum which prepares for entry into a school or college of forestry, and a pre-theological program for students interested in the rural ministry. The curriculum in agricultural science provides a flexible program for students who wish to prepare for graduate study in agricultural fields or for technical work requiring more science or mathematics, or both, than can be included in the general agriculture curriculum. It presupposes careful program planning under the supervision of a properly selected faculty adviser, especially after the freshman year. The general agriculture curriculum is broad and flexible, with sufficient electives to meet specific needs. Graduates from this curriculum engage in various types of farming, in educational and extension work, in civil or public service, in the marketing of agricultural products, in the sale and service of agricultural equipment and supplies, in agricultural credit work, and in numerous other activities related to agriculture. Graduates from the general agriculture curriculum with a major for teachers of vocational agriculture are prepared to teach in the high schools of Illinois and most other states. The curriculum in dairy technology leads to employment in the dairy manufacturing industry, or to research or teaching in this field. The floriculture curriculum prepares for employment in the production and sale of flowers and other ornamental plants. The curriculum in food technology is designed for students planning technical or administrative careers in food processing or food marketing. The curriculum in restaurant management provides, in addition to training in this field, preparation for work as purchasing agents, kitchen equipment and layout specialists, food inspectors, and for other allied occupations.

In home economics the College of Agriculture provides a four-year general curriculum leading to the degree of Bachelor of Science. Within this curriculum major programs are provided in apparel design, child and



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family, foods and nutrition, general home economics, hospital dietetics household management, institution management, retailing apparel and home furnishings, and textiles and clothing. Graduates in home economics are engaged in homemaking; in teaching; as dietitians in hospitals and other institutions; in management of cafeterias, dormitories, and the food service units in hotels, clubs, airlines, and bus lines; in retailing in the textiles, clothing, and home furnishings fields; in research in colleges and universities, government agencies, and industry; in extension services; and as nutritionists and consultants with public health and social agencies. Students preparing to teach home economics in high schools having departments of vocational home economics should enroll in the curriculum in home economics education.

The curriculum in agricultural engineering, which is administered by the College of Engineering, includes general and specialized courses offered in the College of Agriculture.

The first two years in each curriculum include the necessary scientific and cultural basis for later specialization. Each student is assisted in arranging his program by a member of the faculty under the organized advisory system of the College. Each new student in agriculture is supplied with a copy of *A Handbook for Agricultural Students and Their Advisers*. It contains instructions on choice of individual objectives, and suggestions for educational programs of study appropriate to those objectives.

The instructional program of the College of Agriculture is constantly enriched by close association with the work of the Agricultural Experiment Station and the Extension Service in Agriculture and Home Economics. Staff members and students thus have direct contact with current problems in research and practice.

### REQUIREMENTS FOR ADMISSION

Besides meeting the general admission requirements of the University, students entering the College of Agriculture are required to have one high school unit of algebra and one of plane geometry. It is recommended that prospective students take an additional half unit of mathematics, a unit of physics, or a unit of chemistry. A high school major in science or mathematics is desirable.

### REQUIREMENTS FOR GRADUATION

Students who have satisfied the general University requirements for graduation, have maintained throughout their course a satisfactory record of scholarship and moral character, and have completed a curriculum in the College of Agriculture including the prescribed studies and sufficient electives to make a total of 130 semester hours in all curricula except in home economics are graduated with the degree of Bachelor of Science. The requirement for the degree of Bachelor of Science in Home Economics is 120 hours exclusive of required work in physical education. The requirement for the degree of Bachelor of Science in Home Economics Education is 124 hours exclusive of required work in physical education. (For special requirements of each curriculum, see the outlines on the following pages.)

A candidate for graduation must complete all special examinations to remove failures, all proficiency examinations, and all course substitutions by the beginning of the tenth week of his final semester.

Students who have transferred from other educational institutions to the University of Illinois and are candidates for the degree of Bachelor of Science in an agricultural curriculum are required to complete in residence at least half the technical agriculture credit required for the degree. Graduates of approved colleges may secure a degree in agriculture from the University on completion of the technical and scientific requirements. This usually requires two years of residence work; a minimum of one year is required.

### HONORS AT GRADUATION

Honors awarded at graduation to superior students are designated, after the degree on the diploma, as Honors, High Honors, and Highest Honors, according to the following rules: For the degree with Honors, the student must have an average of 4.0 in all courses used for graduation; for the degree with High Honors, a student must have an average of 4.25 in all courses counted toward graduation and pass a comprehensive examination in his field of major interest; and for the degree with Highest Honors, the student must have an average of 4.5 in all courses used for graduation and give evidence of exceptional ability by passing a comprehensive examination in his field of major interest.

### DEPARTMENTS AND CURRICULA

The College of Agriculture comprises nine departments which offer courses open to all qualified students in the University. These departments, their work and equipment, are described in the following paragraphs with reference to the curricula as outlined on subsequent pages.

**Agricultural Economics.** Courses in agricultural economics pertain to economic principles as applied to agriculture, farm management, land economics, agricultural marketing, agricultural credit, agricultural law, agricultural prices and statistics, and rural organizations. A basic course in agricultural economics is designed to give an introduction to these fields. A more advanced course deals with the external economic relationships of agriculture, while work in farm management deals with the internal economic relationships of farming based on financial and detailed cost records secured from farmers throughout Illinois. Work in land economics includes utilization, tenure, and conservation of land, while a course in farm appraisals is conducted in cooperation with other departments. Courses are available dealing with the principles and problems of agricultural marketing and cooperation, as well as with the particular problems connected with the marketing of grain, livestock, dairy products, and horticultural products. Work is offered in the field of agricultural credit, dealing with the credit needs of farmers and the means of supplying these needs. A course in agricultural law deals with the relation of law to land tenure, farm tenancy, farm labor, livestock, drainage, and other phases of the farm business. Courses in agricultural prices and statistics include work in price analysis and the application of statistical methods to agricultural data. Work in rural organization deals with the structure and functions of and participation in farmers' organizations and trends in their development. Provision is made for advanced study in all of these fields by qualified undergraduate and graduate students.

**Agricultural Engineering.** Courses in agricultural engineering cover the principles of engineering as applied to agriculture, including engineering problems of agriculture, farm shop, soil and water engineering, farm buildings and housing, farm field machinery, tractors, horticultural machinery, crop processing, rural electrification, and farm home equipment. Students in the various agricultural curricula take suitable courses in agricultural engineering, and students enrolled in the curriculum in general agriculture can complete a major in farm mechanization by appropriate choice of courses.

Students who plan to enter teaching, research, design, or other commercial or industrial work in agricultural engineering should investigate the curriculum offered in the College of Engineering (page 110).

**Agronomy.** Instruction in both crops and soils is given in the Department of Agronomy. Under crops are included such subjects as characteristics, production, and improvement of farm crops as well as the nature and control of crop enemies such as weeds, plant diseases, and insect pests. Courses in soils deal with the origin, formation, and classifica-

tion of soils and also with variation, modification, and maintenance of productivity Facilities for instruction include laboratories, field house, greenhouse, and field plots Advanced students have opportunity to use these facilities both in their courses and in individual investigations.

**Animal Science.** Courses in animal science cover the study of sheep, swine, poultry and beef cattle, and their products; heavy and light horses, with their care and training, the management of herds, flocks, and studs; feeding, breeding, general sanitation, and disease control in livestock; and the chemical and physiological phases of animal nutrition. The University herds, flocks, and studs contain several hundred purebred cattle swine, sheep, and horses, and several hundred fowl, which are available for class purposes and for feeding and breeding investigations. The Stock Judging Pavilion offers opportunity for show and judging work. The department equipment includes buildings for the housing of beef cattle, swine, sheep, horses, and poultry, and a feed storage barn with grinding mills and other feed preparation machinery. Laboratories afford facilities for undergraduate and advanced study in animal nutrition and animal genetics.

**Dairy Science.** The courses in dairy science are concerned with the breeding and feeding of dairy cattle, including genetics, nutrition, and physiology; management, sanitation, and judging of dairy cattle; and the biochemical, physiological, and bacteriological phases of milk production and utilization. The equipment of this department includes laboratories for dairy bacteriology, dairy biochemistry, and dairy production. A farm stocked with a herd of more than 250 head of dairy cattle of the Holstein-Friesian, Jersey, Guernsey, Brown Swiss, and Ayrshire breeds affords facilities for undergraduate and advanced study in the several phases of work listed above.

**Food Technology.** Instruction in food technology, including dairy technology, is conducted in this department. The department is responsible for all courses in food processing except those which have to do with preparation of food in the home. Students majoring in food technology are offered two undergraduate curricula, one leading to the degree of Bachelor of Science in Food Technology and the other to the degree of Bachelor of Science in Dairy Technology. Graduate study leading to the master's and doctor's degrees is available in both fields. The equipment of this department includes a commercial-type creamery with provisions for making butter, cheese, condensed milk, ice cream, powdered milk, and other milk products. Pilot plant facilities for the processing and preservation of fruits, vegetables, cereals, oilseeds, meats, and other classes of foods are available. These include modern equipment of commercial types for canning, freezing, dehydrating, cereal milling, oilseed processing, vacuum concentrating, and other operations involved in food manufacture. Laboratories for research and teaching in chemistry, microbiology, and engineering as applied to all types of food products and processes are available.

**Forestry.** The preforestry curriculum provides two years of study in subjects prerequisite to technical training in forestry. It prepares the student to enter a school of professional forestry with two years of advanced standing. Although registration is in the College of Agriculture, many of the courses of instruction are in the Colleges of Liberal Arts and Sciences and Engineering. The preforestry curriculum utilizes the laboratory, drafting, demonstration, and classroom facilities of several departments in each of these colleges as well as those of the College of Agriculture. The equipment of the Department of Forestry includes maps, charts, lantern slides, and a working library of some 3,500 books and pamphlets on forestry. Students who are interested in forestry as a profession should consult the Head of the Department of Forestry concerning registration.

**Home Economics.** Courses given in this department are planned to present material basic to homemaking and family life and to train students for careers in professions allied to homemaking. Opportunity is given for concentration in the following fields: apparel design, child and family, foods and nutrition, general home economics, hospital dietetics, household management, institution management, retailing apparel and home furnishings, textiles and clothing, and teacher education. The department is housed in Bevier Hall, where there are specially equipped laboratories and lecture rooms and a cafeteria and tearoom which are used as teaching laboratories. Facilities for demonstration and practice in household management are provided in the Home Management House.

Several courses have been especially designed to meet the needs of non-major students who desire work in home economics to supplement a profession or for personal needs. These courses, described on page 356, have no prerequisites.

A curriculum in restaurant management, intended for both men and women, is supervised by the Department of Home Economics. In addition to courses covering the general education requirements for all students, the curriculum provides a combination of business and food-service training intended to fit the needs of students planning employment in food-service establishments.

**Horticulture.** Courses in horticulture provide instruction in five divisons (pomology, vegetable crops, floriculture, plant breeding, and plant pathology) and in subjects dealing with all these divisions, such as plant propagation, spraying, the evolution of horticultural plants, and experimental horticulture. For instruction in pomology and plant pathology, use is made of the varietal and experimental plantations maintained by the department and of the Horticulture Field Laboratory. This building is equipped with cold storage rooms, constant-temperature chambers, and a greenhouse, and with chemical, physiological, histological, and pathological laboratories. Facilities for instruction in vegetable crops include a physiological laboratory, greenhouses, and several acres of land on which garden operations are illustrated and the principal vegetable crops are grown. A laboratory furnishes opportunity for the study of methods of packing. The equipment for floriculture includes ten glasshouses, a service building, and laboratory facilities. The houses contain a selection of roses, carnations, and chrysanthemums, and of plants representing the forms used in commercial and decorative or conservatory work.

## Curriculum in Agricultural Engineering

### For the Degree of Bachelor of Science in Agricultural Engineering

This curriculum, outlined on page 110, is administered in the College of Engineering. Requirements for the first year are the same as in other engineering curricula. Courses in agriculture and agricultural engineering begin in the second year. In the junior and senior years the student chooses either the power and machinery option with mechanical engineering design courses, or the farm structures, soil and water conservation option with civil engineering design courses.

Students in this curriculum may secure two degrees in five years by simultaneous combination of the curriculum in agricultural science or the curriculum in general agriculture, administered by the College of Agriculture, and the curriculum in agricultural engineering, administered by the College of Engineering. The degrees awarded are Bachelor of Science in Agriculture and Bachelor of Science in Agricultural Engineering. Careful scheduling of courses is necessary. Students following the five-year program should enroll in the College of Agriculture for the first three years and transfer to the College of Engineering for the last two years. The courses in drawing, mathematics, mechanics, and physics should be completed during the first three years. For detailed information, consult the Head of the Department of Agricultural Engineering.

## Curriculum in Agricultural Science

### For the Degree of Bachelor of Science in Agriculture

This curriculum is especially designed for students who plan to do graduate study in agricultural fields or for those who wish to engage in technical work requiring more science or mathematics than is included in the general agriculture curriculum. A student will be permitted to enter the curriculum and to continue in it only if he has a grade-point average of 3.5 or higher. A minimum of 130 hours of credit is required for graduation.

The curriculum lends itself to individualized programs of study. It presupposes careful individual planning under the supervision of a faculty adviser qualified in the student's special field of interest. For assistance in selecting a program plan and for assignment to an adviser, call at the office of the Associate Dean, 104 Mumford Hall.

Two options are provided in this curriculum:

Option 1. For students desiring preparation for graduate study or technical work in animal, plant, or soil science.

Option 2. For students desiring preparation for graduate study or technical work in the fields included in agricultural economics and rural sociology.

**SUMMARY**

| | OPTION 1 HOURS | OPTION 2 HOURS |
|---|---|---|
| General University Requirements (hygiene, military training, physical education, and rhetoric) | 16 | 16 |
| Group I: College of Agriculture Courses | 35 | 35 |
| Group II: Humanities (art, music, language, literature, philosophy) | 6 | 6 |
| Group III: Social Science (economics, geography, history, political science, psychology, sociology) | 6 | 16[2] |
| Group IV: Biological Science (bacteriology, botany, entomology, physiology, zoology) | 10[1] | 6 |
| Group V: Physical Science (chemistry, geology, mathematics, physics) | 10[1] | 16 |
| Electives (unrestricted) | 22 | 35 |
| Total Required for Graduation | 130 | 130 |

| FIRST YEAR FIRST SEMESTER | 15 TO 18 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures | 2 |
| Math. 111—Algebra, or Math. 112—College Algebra[3] | 5 or 3 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 0 to 5 |

| SECOND SEMESTER | 15 TO 18 HOURS |
|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis, or Chem. 106—Inorganic Chemistry | 5 |
| Math. 114—Plane Trigonometry[3] | 2 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 to 6 |

**SECOND, THIRD, AND FOURTH YEARS**

The programs for the second, third, and fourth years should be planned in consultation with the faculty adviser.

## General Curriculum in Agriculture

For the Degree of Bachelor of Science in Agriculture

This curriculum is designed for students in agricultural fields not requiring an intensive science foundation. The fields may include agricultural marketing, animal and poultry science, dairy production, farm crops, farm management, farm mechanization, pomology, rural group leadership, soil conservation, vegetable production, vocational agriculture, and others as agreed upon by the faculty. A minimum of 130 hours of credit is required for graduation.

| FIRST YEAR FIRST SEMESTER | 17 HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Two Courses from Group I | 6 |

| SECOND SEMESTER | 15 TO 18 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Zool. 104—General Zoology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| One Course from Group I | 3 or 4 |

[1] All students in Option 1 must complete a total of forty-five hours in Groups IV and V combined, with a minimum of ten hours in each.

[2] Students in Option 2 must include at least eight hours in economics.

[3] The student planning to take advanced work in chemistry may take Math. 117 or 127 instead of the indicated mathematics course.

| SECOND YEAR | 17 HOURS | | 16 HOURS |
|---|---|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 | Agron. 201—Soils | 5 |
| Geol. 105—Agricultural Geology | 3 | Econ. 108—Elements of Economics | 3 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Three Courses from Group I | 9 | Two Courses from Group I | 6 |

**THIRD AND FOURTH YEARS**

During the third and fourth years the student must elect sufficient courses in agriculture to make a total of fifty hours in agricultural courses including those prescribed. The student must also earn a minimum of twelve semester hours credit in humanities and social studies, and sufficient unrestricted electives to bring his total credits up to the 130 hours required for graduation.

GROUP I: Courses in agriculture required of all students in the general agriculture curriculum. All students should complete this list before the third year or as soon thereafter as possible.

| | HOURS |
|---|---|
| Agr. Econ. 100—Introductory Agricultural Economics[1] | 3 |
| Agr. Eng. 101—Introduction to Agricultural Engineering | 3 |
| Agron. 121—Crop Production | 4 |
| An. Sci. 101—Introduction to Animal Science | 3 |
| An. Sci. 102—Principles of Feeding | 3 |
| D.S. 100—Introduction to Dairy Production | 3 |
| Forestry 101—General Forestry, or Forestry 102—Farm Forestry, or Horticulture Elective | 3 |
| Hort. 100—Introductory Horticulture | 3 |
| Total | 25 |

GROUP II: A minimum of twelve hours in humanities and social studies to be selected from art, economics, English, foreign language, geography, history, journalism, landscape architecture, law, music, philosophy, political science, psychology, sociology, or speech.

## Curriculum in General Agriculture with Major for Teachers of Vocational Agriculture

For the Degree of Bachelor of Science in Agriculture

The purpose of this curriculum is to train young men to teach agriculture in high schools having departments of vocational agriculture. In addition to the training outlined in this curriculum, the present Illinois State Plan for Teachers of Vocational Agriculture calls for a minimum of two years of practical experience on the farm after reaching the age of sixteen.

A minimum of 130 hours of credit, counting the first two years in military training and physical education, as outlined below, is required for graduation. While students are advised to take courses in the order indicated, they may, with the approval of their advisers, take courses at another time.

Students who complete this curriculum will possess a teaching minor in the biological sciences and are also qualified to teach general science.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

[1] Students entering as juniors or seniors should substitute Agr. Econ. 220 or 230 for Agr. Econ. 100.

| FIRST YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Two Courses from Group I | 6 |

| SECOND SEMESTER | 15 TO 18 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Zool. 104—General Zoology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| One Course from Group I | 3 or 4 |

| SECOND YEAR | 16 HOURS |
|---|---|
| Agr. Eng. 111—Farm Structures and Soil and Water Conservation, or Agr. Eng. 112—Tractors and Field Machinery | 3 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Geol. 105—Agricultural Geology | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Two Courses from Group I | 6 |

| | 17 HOURS |
|---|---|
| Agr. Eng. 112—Tractors and Field Machinery, or Agr. Eng. 111—Farm Structures and Soil and Water Conservation | 3 |
| Chem. 132—Elementary Organic Chemistry | 3 |
| Econ. 108—Elements of Economics | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Two Courses from Group I | 6 |

| THIRD YEAR | 15 TO 18 HOURS |
|---|---|
| Agron. 201—Soils | 5 |
| Psych. 100—Introduction to Psychology | 4 |
| Speech 101—Principles of Effective Speaking | 3 |
| Agricultural Electives | 3 to 6 |

| | 16 HOURS |
|---|---|
| Agr. Econ. 220—Farm Management | 3 |
| Ed. 201—Foundations of American Education | 3 |
| Ed. 240—Principles of Secondary Education | 3 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Agricultural Electives | 4 |

Semesters of the fourth year are interchangeable. Courses taken with practice teaching will be offered during a ten-week period.

| FOURTH YEAR | 15 OR 16 HOURS |
|---|---|
| Agr. Ed. 276—Practice in Agricultural Education | 5 |
| Agr. Ed. 277—Programs and Procedures in Agricultural Education | 5 |
| Agr. Eng. 201—Farm Shop Work, or D.S. 204—Dairy Production,[1] or other Agricultural Elective | 2 or 3 |
| Ed. 211—Educational Psychology | 3 |

| | 14 TO 20 HOURS |
|---|---|
| Pol. Sci. 150—American Government | 3 |
| Electives (including two hours of humanities)[2] | 11 to 17 |

GROUP I. Courses in agriculture required of all students in the general agricultural curriculum:

| | HOURS |
|---|---|
| Agr. Econ. 100—Introductory Agricultural Economics | 3 |
| Agron. 121—Crop Production | 3 |
| An. Sci. 101—Introduction to Animal Science | 3 |
| An. Sci. 102—Principles of Feeding | 3 |
| D.S. 100—Introduction to Dairy Production | 3 |
| Hort. 100—Introductory Horticulture | 3 |
| Forestry 101—General Forestry, or Forestry 102—Farm Forestry, or Horticulture Elective | 3 |
| Total | 21 |

[1] D.S. 204 is offered in the second semester only.
[2] A total of six hours of humanities is necessary for certification.

For the Degree of Master of Science in Agricultural Education

| IFTH YEAR FIRST SEMESTER | 4 UNITS |
|---|---|
| ‹gricultural Courses with Graduate Credit | 2 |
| d. 311—Psychology of Learning for Teachers | ½ |
| d. 312—Mental Hygiene and the School | ½ |
| lectives | 1 |

| SECOND SEMESTER | 4 UNITS |
|---|---|
| Agricultural Courses with Graduate Credit | 2 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Electives | 1 |

## Program in Agriculture and Law

A plan has been agreed upon between the College of Agriculture and the College of Law by which a student may earn the degree of Bachelor of Science in Agriculture and the degree of Bachelor of Laws in six years. In this case the student must plan carefully so as to include all prescribed courses in agriculture during the first three years, after which he transfers to the College of Law for the fourth year. He can thus receive the Agricultural degree at the end of the fourth year and the law degree at the end of the sixth year. This program can best be fitted into the agricultural science curriculum under Option 2. Students who are interested may obtain an outline of this plan from the Office of the Associate Dean, 104 Mumford Hall.

## Curriculum in Dairy Technology

For the Degree of Bachelor of Science in Dairy Technology

The following program is designed for students interested in the technical or business aspects of dairy manufacturing. A minimum of 130 hours of credit is required for graduation.

All students specializing in dairy technology are expected to take an inspection trip either in the junior or senior year. This trip costs about $35.

| IRST YEAR FIRST SEMESTER | 13 TO 17 HOURS |
|---|---|
| hem. 101 or 102—General Chemistry | 5 or 3 |
| lygiene 101—Health Lectures | 2 |
| Math. 111—Algebra, or Math. 112—College Algebra | 5 or 3 |
| het. 101—Rhetoric and Composition | 3 |
| hysical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 15 HOURS |
|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| D.S. 100—Introduction to Dairy Production | 3 |
| Math. 114—Plane Trigonometry | 2 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| ECOND YEAR | 17 HOURS |
|---|---|
| act. 104—Introductory Bacteriology | 5 |
| .T. 101—Introduction to Dairy Technology | 3 |
| .T. 103—Dairy Products Judging | 1 |
| con. 108—Elements of Economics | 3 |
| hysical Education | 1 |
| Military (men) | 1 |
| lectives | 3 |

| | 16 HOURS |
|---|---|
| Chem. 122—Elementary Quantitative Analysis | 5 |
| D.S. 150—General Dairy Bacteriology | 2 |
| D.S. 151—General Dairy Bacteriology | 3 |
| D.T. 104—Dairy Products Judging | 1 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| THIRD YEAR | 18 OR 19 HOURS |
|---|---|
| Chem. 133—Elementary Organic Chemistry | 5 |
| D.T. 303—Cheese Manufacture | 3 |
| D.T. 304—Market Milk | 3 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Electives | 2 or 3 |

| | 17 HOUI |
|---|---|
| Accy. 201—Fundamentals of Accounting | |
| D.T. 302—Creamery Butter Manufacture | |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | |
| Electives | |

| FOURTH YEAR | 18 HOURS |
|---|---|
| D.T. 301—Ice Cream Manufacture | 3 |
| Electives | 15 |

| | 18 HOUI |
|---|---|
| D.T. 306—Condensed Milk and Milk Powder Manufacture | |
| Electives | 1 |

Group I: A minimum of fifteen hours in courses offered by the College of Agricu ture is required in addition to those agricultural courses prescribed. Electives in th group are to be chosen from advanced courses with the guidance of an adviser.

Group II: A minimum of twelve hours to be selected from art, economics, Englisl foreign language, geography, history, journalism, landscape architecture, law, musi philosophy, political science, psychology, sociology, or speech.

## Curriculum in Floriculture

For the Degree of Bachelor of Science in Floriculture

The following program is designed for students preparing to grow and sell flowe and other ornamental plants or to do teaching and research in this field. In addition t prescribed courses, a minimum of four hours is required in English, foreign languag geography, history, landscape architecture, philosophy, political science, psycholog rhetoric, sociology, or speech. A minimum of 130 hours of credit is required for grad ation.

Students registered in floriculture are required to make at least one inspection tri before graduation. The trip costs about $25.

| FIRST YEAR FIRST SEMESTER | 17 TO 19 HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Chem. 101 or 102—General Cheimstry | 5 or 3 |
| Hort. 121—Plant Propagation | 3 |
| Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 TO 18 HOUI |
|---|---|
| Chem. 132—Elementary Organic Chemistry | |
| Entom. 101 and 102—Destructive and Useful Insects | |
| Rhet. 102—Rhetoric and Composition | |
| Physical Education | |
| Military (men) | |
| Electives | 3 to |

| SECOND YEAR | 16 TO 18 HOURS |
|---|---|
| Accy. 101—Principles of Accounting | 3 |
| Bot. 130—Plant Physiology | 5 |
| Econ. 108—Elements of Economics | 3 |
| Geol. 105—Agricultural Geology | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 0 to 2 |

| | 16 TO 18 HOUI |
|---|---|
| Accy. 105—Accounting Procedure | |
| Agron. 201—Soils | |
| Bot. 160—Introductory Systematic Botany | |
| Hort. 122—Greenhouse Management | |
| Physical Education | |
| Military (men) | |
| Electives | 0 to |

| HIRD YEAR | 15 TO 18 HOURS |
|---|---|
| ot. 317—Plant Pathology | 3 |
| lort. 223—Commercial Floricultural Crops | 3 |
| lort. 321—Floricultural Physiology | 3 |
| .A. 251—Trees and Shrubs | 3 |
| lectives | 3 to 6 |

| | 15 TO 18 HOURS |
|---|---|
| Hort. 224—Commercial Floricultural Crops | 3 |
| Hort. 230—Garden Flowers | 3 |
| Hort. 322—Plant Nutrition | 3 |
| L.A. 252—Trees and Shrubs | 3 |
| Electives | 3 to 6 |

| OURTH YEAR | 15 TO 18 HOURS |
|---|---|
| ort. 231—Floral Decoration | 3 |
| lectives | 12 to 15 |

| | 15 TO 18 HOURS |
|---|---|
| Hort. 226—Tender Bedding Plants | 3 |
| Hort. 232—Floral Decorations | 3 |
| L.A. 164—Appreciation of Landscape Architecture | 3 |
| Electives | 6 to 9 |

**UGGESTED ELECTIVES (Second, Third, or Fourth Year)**

| | HOURS |
|---|---|
| gron. 323—Improvement of Farm Crops by Breeding | 3 |
| ot. 322—Genetics | 4 |
| us. Law 261—Summary of Business Law | 3 |
| ntom. 319—Chemical Control of Insects | 4 |
| ort. 204—Spraying | 3 |
| ort. 345—Growth and Development of Vegetable Crops | 4 |
| ort. 382—Improvement of Horticultural Crops by Breeding | 3 |
| ktg. 101—Principles of Marketing | 3 |
| ktg. 271—Salesmanship | 2 |
| ktg. 281—Introduction to Advertising | 3 |
| et. 151—Business Letter Writing | 2 |

## urriculum in Food Technology

For the Degree of Bachelor of Science in Food Technology

This program is designed for students who wish to prepare for employment as food roduction, quality control, research, or technical sales workers in governmental agencies, lucational institutions, and in such food processing industries as canning, freezing, fer- enting, milling and baking, vegetable oil processing, and confection manufacturing. A tal of 130 hours of credit, not counting the first two years of military training and physi- al education, is required for graduation.

Students are strongly urged to engage in at least one summer of employment in lected food processing industries and are required to go on a senior inspection trip three days' duration. Estimated cost of inspection trip is $35.

| RST YEAR FIRST SEMESTER | 14 TO 16 HOURS |
|---|---|
| em. 101 or 102—General Chemistry | 5 or 3 |
| G.S. 111—Verbal Communication | 4 |
| giene 101—Health Lectures | 2 |
| ath. 117—Combined Freshman Mathematics[1] | 5 |
| ysical Education | 1 |
| ilitary (men) | 1 |

| SECOND SEMESTER | 17 HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| D.G.S. 112—Verbal Communication | 4 |
| Math. 127—Combined Freshman Mathematics[1] | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

[1]Students lacking the necessary entrance requirements for Math. 117 will take the sequence of ath. 111, Algebra, Math. 114, Plane Trigonometry, and Math. 122, Analytic Geometry.

| SECOND YEAR | 17 HOURS | | 16 HOUI |
|---|---|---|---|
| Chem. 122—Elementary Quantitative Analysis | 5 | Chem. 133—Elementary Organic Chemistry | |
| Math. 137—Calculus[1] | 3 | Math. 147—Calculus[1] | |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | |
| Zool. 104—General Zoology | 4 | Physical Education | |
| Physical Education | 1 | Military (men) | |
| Military (men) | 1 | Electives | |

| THIRD YEAR | 17 HOURS | | 17 HOUI |
|---|---|---|---|
| Bact. 104—Introductory Bacteriology | 5 | Bact. 308—Food and Applied Bacteriology | |
| Chem. 247—Elementary Physical Chemistry[2] | 4 | Chem 249—Chemistry of Colloids[2] | |
| F.T. 201—Elements of Food Technology | 3 | F.T. 202—Elements of Food Technology | |
| F.T. 269—Raw Materials for Processing | 3 | F.T. 270—Raw Materials for Processing | |
| Electives | 2 | Electives | |

| FOURTH YEAR | 16 HOURS | | 16 HOUI |
|---|---|---|---|
| Chem. 350—Biochemistry | 5 | Chem. 329—Food Analysis | |
| F.T. 301—Food Processing | 4 | F.T. 206—Inspection Trip | |
| F.T. 363—Unit Operations in Food Technology | 3 | F.T. 302—Food Processing | |
| Electives | 4 | F.T. 332—Principles of Sanitation in the Processing and Handling of Foods | |
| | | Electives | |

**ELECTIVES**

A minimum of fifteen hours shall be selected from art, economics, English, foreig language, geography, history, journalism, landscape architecture, law, music, philosoph political science, psychology, sociology, and speech. Social science courses offered by th Division of General Studies may be used to satisfy this requirement. Students conten plating continuation of their studies for an advanced degree are advised to elect one the foreign languages.

## Curriculum in Restaurant Management

**For the Degree of Bachelor of Science in Restaurant Management**

This four-year curriculum is provided for men and women who desire training i restaurant management. In addition to preparation for this field, students may, by use appropriate electives, prepare for work as purchasing agents, kitchen equipment an layout specialists, food inspectors, and for other allied occupations. A total of 130 hou of credit is required for graduation.

Two summers (a minimum of eight weeks each), or equivalent, of practical re taurant experience are required and should be completed before registering in Hom Economics 355. This experience normally should come at the end of the second an third years.

[1] Students who follow the algebra, trigonometry, analytic geometry sequence will take Math. 132 an 142, Calculus.

[2] Students adequately qualified may substitute Chem. 240 and 342, Elementary Physical Chemistr for Chem. 247 and 249.

| FIRST YEAR FIRST SEMESTER | 14 TO 16 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry, or Electives[1] | 5 or 3 |
| Hygiene 101—Health Lectures | 2 |
| Physiol. 103—Introduction to Human Physiology | 4 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 15 TO 17 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry, or Electives[1] | 5 or 3 |
| Psych. 103—Human Behavior | 4 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 15 TO 17 HOURS |
|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 |
| English Literature | 3 |
| Home Econ. 130—Introduction to Foods and Nutrition | 2 |
| Sociol. 100—Principles of Sociology | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 to 4 |

| | 15 TO 18 HOURS |
|---|---|
| Bact. 104—Introductory Bacteriology | 5 |
| Econ. 108—Elements of Economics | 3 |
| English Literature | 3 |
| Rhet. 151—Business Letter Writing | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 0 to 3 |

| THIRD YEAR | 16 OR 17 HOURS |
|---|---|
| Accy. 101—Principles of Accounting, or Accy. 201—Fundamentals of Accounting[2] | 3 |
| An. Sci. 104—Selection and Use of Meat | 2 |
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 240—Labor Problems | 3 |
| Home Econ. 131—Foods | 3 |
| Electives | 2 or 3 |

| | 17 HOURS |
|---|---|
| Accy. 105—Accounting Procedure,[2] or Electives | 3 |
| Econ. 248—Personnel Administration | 3 |
| Home Econ. 220—Dietetics | 3 |
| Home Econ. 240—Quantity Cookery | 5 |
| Mktg. 101—Principles of Marketing | 3 |

| FOURTH YEAR | 16 TO 18 HOURS |
|---|---|
| Accy. 265—Hotel Accounting | 3 |
| Home Econ. 345—Institution Management | 3 |
| Home Econ. 350—Institution Dietaries and Administration | 4 |
| Electives | 6 to 8 |

| | 15 TO 18 HOURS |
|---|---|
| Home Econ. 253—Restaurant Interior | 3 |
| Home Econ. 355—Advanced Quantity Cookery and Catering | 3 |
| Mgmt. 204—Industrial Purchasing | 3 |
| Electives | 6 to 9 |

## Preforestry Program

The object of the two-year preforestry curriculum is to prepare young men to enter a school of professional forestry with two years of advanced standing. The preforestry curriculum provides a course of study similar to that given during the first two years at a school of forestry. Completion of the preforestry curriculum requires a minimum of sixty-nine hours of work in addition to the University requirements in military training and physical education. Many forestry schools have adopted high scholarship requirements and will not accept students who do not maintain high grades. Some of them will not accept out-of-state students whose averages in their preforestry work are below 4.0. A student who wishes to follow this curriculum should declare his intention as soon as possible and ask to be assigned to a faculty adviser in the Department of Forestry. The faculty adviser should be consulted about the choice of electives best suited to admission to the particular school of forestry which the individual expects to enter.

[1] Students taking Chem. 101 or 102 the first semester may take electives the second semester; those taking electives the first semester must take Chem. 101 or 102 the second semester.

[2] Students who elect Accy. 101 must also take Accy. 105.

| FIRST YEAR FIRST SEMESTER | 17 TO 19 HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Forestry 101—General Forestry | 3 |
| Hygiene 101—Health Lectures | 2 |
| Math. 111—Algebra, or Math. 112—College Algebra | 5 or 3 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 TO 20 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| G.E.D. 101—Elements of Drawing | 4 |
| Math. 114—Plane Trigonometry | 2 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Zool. 104—General Zoology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 16 TO 18 HOURS |
|---|---|
| C.E. 115—General Surveying | 3 |
| Econ. 108—Elements of Economics | 3 |
| Geol. 105—Agricultural Geology | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 5 to 7 |

| | 18 HOURS |
|---|---|
| Agron. 201—Soils | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 11 |

**ELECTIVES**

| | HOURS |
|---|---|
| Bot. 130—Plant Physiology | 5 |
| Bot. 160—Introductory Systematic Botany | 3 |
| Chem. 132—Elementary Organic Chemistry | 3 |
| Geog. 111—Introduction to Meteorology | 3 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Pol. Sci. 150—American Government | 3 |
| Speech 101—Principles of Effective Speaking | 3 |

## Curriculum in Home Economics

For the Degree of Bachelor of Science in Home Economics

This four-year curriculum is provided for students in the College of Agriculture who desire general or professional training in home economics. The 120 hours required for graduation include prescribed courses of which at least twenty-nine hours must be in home economics courses selected according to the requirements for the various options (see page 65).

The first two years of this curriculum, shown in detail on page 66, provide a foundation for the various fields of concentration and allow some variation according to the purposes of individual students. The third and fourth years are largely determined by the option selected; these are described on page 66. Students who hold scholarships in home economics must take at least four hours each semester in home economics or in courses prerequisite thereto. At least five hours of advanced courses in one of the fields of concentration must be taken in residence at the University by any student transferring from another institution.

A student may also qualify for a baccalaureate degree in home economics in the College of Liberal Arts and Sciences (page 166).

**PRESCRIBED COURSES**

| | HOURS |
|---|---|
| Art 185[1] | 2 |
| Bact. 104[2] | 5 |
| Chem. 101 or 102[2] and 132 or 133 | 6 to 10 |
| Econ. 108 | 3 |
| English Literature | 6 |
| Home Economics (Groups I, II, and III) | 29 |
| Hygiene 101 | 2 |
| Physical Education (four semesters) | 0 |
| Physiol. 103[2] | 4 |
| Psych. 100 or 103 | 4 |
| Rhet. 101 and 102 | 6 |
| Social Sciences[3] | 6 |
| Sociol. 100 | 3 |
| Total, Prescribed | 76 to 80 |
| Open Electives | 44 to 40 |
| Total Required for Graduation | 120 |

Home Econ. 101, 102, 103, and 104 core courses, may be substituted for Home Econ. 130, 161, 170, 180, 182, 185, 201, 232, and 272.

Group I: The following courses totaling nine hours are required of all students in the curriculum: Home Econ. 130, 170, 180, and 201. (For core course exemptions, see above.)

Group II: A minimum of eight hours from the following courses is required: Home Econ. 131, 161, 162, 182, 185, 186, 272. Home Econ. 232 is also a Group II course for Options 5 and 7. Students concentrating in Options 2 or 6 must select twelve hours from this group. (For core course exemptions, see above.)

Group III: A minimum of twelve hours of advanced courses in home economics must be selected from the following options:

1. **Apparel Design.** Home Econ. 285, 286, 386, 395 are required. Accy. 201; Art 115, 117, 118, 119, 120, 125, 126, 223, 224; Econ. 378; Rhet. 151; and Speech 101 are also required.

2. **The Child and the Family.** Home Econ. 202, 210, 228, 301, 305 are required; Anthrop. 107 is also required.

3. **Foods and Nutrition.** Home Econ. 220, 232, 324, 330 are required. Chem. 105, 122, 133 (instead of 132), and 350 are also required.

4. **General Home Economics.** Twelve hours are to be selected from home economics courses numbered in the 200 and 300 series, except Home Econ. 272.

5. **Hospital Dietetics.** Home Econ. 220, 240, 320, 345, 350; Chem. 105, 133 (instead of 132), 350; and Ed. 211 are required.

6. **Household Management.** Home Econ. 232 and 273 are required. Six additional hours are to be selected from Home Econ. 202, 210, 262, 361, 378, and 379.

7. **Institution Management.** Home Econ. 220, 240, 330, 345, 350; Accy. 101 and 105, or 201; Econ. 248; and Ed. 211 are required. In order to meet the American Dietetic Association training course requirements, the following courses must be included: Chem. 105, 133, 350.

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[1] Each student following Option 1 or 8 must take the art courses prescribed in these options.

[2] Students in Options 1 and 8 need not take Chem. 132 or 133, nor the prescribed bacteriology and physiology courses, but they must take a total of ten hours of laboratory sciences, including Chem. 101 or 102 and an additional five to seven hours chosen from courses in bacteriology, botany, geology, or physiology.

[3] Only students concentrating in Options 2, 4, 6, or 9 must take at least six hours in economics, history, philosophy, political science, psychology, or sociology, in addition to Econ. 108, Psych. 100 or 103, and Sociol. 100.

**8. Retailing Apparel and Home Furnishings.** Eleven hours are to be selected from Home Econ. 262, 285, 286, 380, 388 or 389, 395. The following courses are also required: Accy. 201; Art 115, 185, and 186; Econ. 378; Mktg. 101, 211, 271, 281, 315; Rhet. 151; Speech 101.

**9. Textiles and Clothing.** Home Econ. 286 is required. Nine additional hours must be selected from Home Econ. 202, 210, 262, 285, 291 or 292, 380, 386, 388, 389, 395. Art 186 is also required.

**Journalism and Home Economics.** For students interested in combining journalism with home economics, a program of twenty hours in journalism is recommended by the School of Journalism and Communications and the Department of Home Economics. This program may be combined with any of the nine options in Home Economics. It includes Journ. 211, 281, and 261 as required courses plus twelve additional hours to be selected from Journ. 204, 212, 223, 227, 263, 321, 323, 328, 365, 382, 386, and Mktg. 101.

Students preparing to teach home economics in secondary schools should follow the curriculum in home economics education (see page 67).

## SUGGESTED SEQUENCE OF PRESCRIBED COURSES

| FIRST YEAR — FIRST SEMESTER | 15 TO 17 HOURS |
|---|---|
| Art 185—Design[1] | 2 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Home Econ. 170—Introduction to Home Economics | 1 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Hygiene 101—Health Lectures, or Home Econ. 130—Introduction to Foods and Nutrition | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| Chem. 132—Elementary Organic Chemistry[2] | 3 |
| Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures | 2 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Electives | 5 to 7 |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| English Literature | 3 or 4 |
| Physiol. 103—Introduction to Human Physiology[3] | 4 |
| Psych. 100—Introduction to Psychology, or Psych. 103—Human Behavior | 4 |
| Physical Education | 1 |
| Electives | 0 or 2 |

| | 15 TO 18 HOURS |
|---|---|
| Bact. 104—Elementary Bacteriology[3] | 5 |
| English Literature | 2 or 3 |
| Sociol. 100—Principles of Sociology | 3 |
| Courses from Group II[4] | 6 or 4 |
| Physical Education | 1 |

### THIRD AND FOURTH YEARS

In the third and fourth years each student will complete the prescribed courses in the chosen area of concentration and will elect courses from Groups II and III to complete the requirements for advanced work.

Those who choose Option 3 should take Chem. 122 and Home Econ. 232 in the first semester of their third year.

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[1] Each student following Options 1 or 8 must take the art courses prescribed in these options.

[2] Each student concentrating in Options 3 or 5 must take Chem. 105 the second semester and delay Chem. 133 until the second year.

[3] Students in Options 1 and 8 need not take Chem. 132 or 133, nor the prescribed bacteriology and physiology courses, but they must take a total of ten hours of laboratory sciences, including Chem. 101 or 102 and an additional five to seven hours chosen from courses in bacteriology, botany, geology, or physiology.

[4] Students preparing for vocations in foods, hospital dietetics, household management, and teaching should include Home Econ. 131 in the second semester of the second year.

## Curriculum in Vocational Home Economics Education

For the Degree of Bachelor of Science in Home Economics Education

The purpose of this curriculum is to prepare young women to teach home economics in junior high schools, senior high schools, and junior colleges. Secondary school courses taught include composite courses in general homemaking, and courses in foods and nutrition, clothing and textiles, home and family living, home management and housing.

A minimum of 124 hours of credit, not counting the first two years in physical education, is required. The courses below total more than 124 hours but represent a typical load of sixteen to eighteen hours each semester. Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours.

The arrangement of courses below is recommended. With the approval of their advisers, students may take courses at another time.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 HOURS |
|---|---|
| Art 185—Design | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 |
| Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| Home Econ. 170—Introduction to Home Economics | 1 |
| Home Econ. 182—Clothing Laboratory | 2 |
| Physiol. 103—Introduction to Human Physiology | 4 |
| Physical Education | 1 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| Art 186—Design | 2 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| D.G.S. 112—Verbal Communication[1] | 4 |
| Home Econ. 130—Introduction to Foods and Nutrition, or Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| Psych. 103—Human Behavior | 4 |
| Physical Education | 1 |

| SECOND YEAR | 17 HOURS |
|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Home Econ. 161—Family Housing | 3 |
| Home Econ. 185—Clothing | 2 |
| Physical Education | 1 |
| Electives[2] | 3 |

| | 17 OR 18 HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Home Econ. 131—Foods | 3 |
| Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 186—Costume Design | 2 |
| Physical Education | 1 |
| Electives[2] | 2 or 3 |

[1] Rhet. 101, 102, and Speech 101 may be taken instead of D.G.S. 111 and 112.

[2] Courses in literature and contemporary social problems are recommended as electives.

| THIRD YEAR | 16 OR 17 HOURS |
|---|---|
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 220—Dietetics | 3 |
| Home Econ. 232—Food Economics and Meal Management | 3 |
| Pol. Sci. 150—American Government | 3 |
| Electives | 4 or 5 |

| | 16 OR 17 HOURS |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Home Econ. 202—Laboratory in Child Development | 2 |
| Home Econ. 228—Hygiene and Home Care of the Sick | 1 |
| Home Econ. 272—Organization and Management of the Home | 3 |
| Home Econ. 286—Clothing | 3 |
| Electives | 3 or 4 |

Semesters of the fourth year are interchangeable.

| FOURTH YEAR | 16 OR 17 HOURS |
|---|---|
| Bact. 104—Elementary Bacteriology | 5 |
| Home Econ. 210—Family Relationships | 3 |
| Home Econ. 273—Home Management | 3 |
| Electives | 5 or 6 |

| | 16 OR 17 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Home Econ. 277—The Teaching of Home Economics | 3 |
| Electives[1] | 2 or 3 |

For the Degree of Master of Science in Home Economics Education

| FIFTH YEAR | UNITS |
|---|---|
| I. Required Professional Courses: | |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 453—Problems in Home Economics Education | 1 |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education, or Home Econ. 377—Home Economics Extension | 1 or ½ |
| Total | 3½ or 4 |
| II. A total of 2 or 2½ units chosen from the following home economics courses: | |
| Home Management: | |
| Home Econ. 361—Farm Home Planning in Relation to Function | ½ |
| Home Econ. 378, 379—Problems in Home Management | ½ to 1 |
| Foods and Nutrition: | |
| Home Econ. 320—Diet in Disease | ½ |
| Home Econ. 322—Physical Growth and Nutrition | ½ |
| Home Econ. 330—Experimental Foods | ½ |
| Home Econ. 331—Problems in Foods | ½ |
| Textiles and Clothing: | |
| Home Econ. 380—Textiles | ½ |
| Home Econ. 386—Clothing Design and Construction | 1 |
| Home Econ. 388, 389—Problems in Textiles and Clothing | ½ to 1 |
| Home Econ. 395—Fashion Analysis | ½ |

[1] This elective must be selected to allow for six weeks off-campus teaching. Suggested are Home Econ. 378, 379, 388, 389.

| | |
|---|---|
| Child Development and Family Relationships: | |
| Home Econ. 301—Advanced Problems in Home Guidance of Children | ½ |
| Home Econ. 410—Problems in Family Living | 1 |
| Home Econ. 481 and/or 482—Seminar in Family Relationships and/or Child Development | 1 |
| III. Electives | 2 |
| Total | 8 |

## Teacher Education Minor in Home Economics

| | HOURS |
|---|---|
| Home Econ. 120—Elementary Nutrition | 2 |
| Home Econ. 125—Introduction to Foods | 3 |
| Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 182—Clothing Laboratory | 2 |
| Home Econ. 185—Clothing | 2 |
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 271—Home Management | 2 |
| Total | 20 |

The University of Illinois Airport can accommodate any type of aircraft now flying.

# Institute of Aviation

The Institute of Aviation is the administrative agency responsible for the promotion and correlation of the educational and research activities related to aviation in all parts of the University. Its cooperative relationships extend into all departments, and its administrative direction is in the hands of a director who has the advice and assistance of an executive committee.

The Institute has a two-year aircraft maintenance curriculum on the college level which is designed not only to prepare students for the Civil Aeronautics Administration Aircraft and Aircraft Engine Mechanic ratings but also to give them a well-rounded education in related subjects.

Many of the various colleges and schools of the University are giving courses with which the Institute of Aviation cooperates. Examples of these are the professional pilot course in the Division of General Studies, the aeronautical engineering curriculum in the College of Engineering, and the airline-airport management courses in the College of Commerce and Business Administration.

From time to time the Institute issues bulletins reporting research and containing information of value to the citizens of the state and to the aeronautical industry. Limited extension service, advice, and help are available through the Institute to Illinois operators and communities having airports.

The Institute, in addition to academic instruction, publication activities, flight training, and aeronautical research, is responsible for the management of the Airport which is owned and sponsored by the University. The Airport, with an area of 762 acres, is located near U. S. Route 45, six miles southwest of the Illini Union Building on the Urbana campus. Its purpose is to implement a comprehensive program of aviation education and research, and to provide commercial and private landing facilities for the promotion of national air transport and defense. The Airport provides the University and the community with excellent air transportation terminal facilities, and also makes possible the effectuation of military aviation training programs. It provides the students with an opportunity to engage in flying activities, both as a part of general education and in connection with professional objectives. The administration, operation, and servicing activities of the Airport furnish students and faculty with an opportunity for laboratory study and research.

The land and rights-of-way for the Airport were purchased by the University from funds appropriated by the General Assembly of Illinois. The present completed facilities, financed by the Civil Aeronautics Administration, through federal funds, and by the Department of Aeronautics

of the state of Illinois, through state funds, consist of three concrete runways each 5,300 feet long and 150 feet wide; one turfed runway 4,000 feet long and 150 feet wide; a total of 12,000 feet of concrete taxiways 50 feet wide; and 89,000 feet of drainage. The large hangar, 360 by 100 feet, provides space for storage and shop activities. Attached to the large hangar is space for classrooms, operations offices, control tower, storage rooms, service utilities, and public rooms with a combined area of 11,000 square feet. T-hangars provide additional space for twenty-five airplanes. Space for research and other educational activities is provided for in the six large Quonset-type buildings with a combined floor area of over 34,000 square feet. The aviation psychology research laboratory is located in one of these buildings. The night-lighting installation provides facilities for making the Airport operative at all times for both educational and commercial purposes.

#### REQUIREMENTS FOR ADMISSION

Admission to the University of Illinois is handled by the Director of Admissions and Records. Courses offered by the Institute of Aviation are open to students and to faculty and staff members in all departments of the University. Any person wishing to enroll as a full-time student in the aircraft maintenance curriculum should apply for admission to the Institute of Aviation.

Students should apply to the Division of General Studies for admission to the professional pilot course; to the College of Engineering for the aeronautical engineering curriculum; and to the College of Commerce and Business Administration for the airline-airport management courses.

All applicants for admission to the Institute of Aviation aircraft maintenance curriculum must have been graduated from high school with a minimum of fifteen entrance units. Subjects required for admission are English, three units; algebra, one unit; and geometry, one unit. It is recommended that the applicant have two units each of industrial arts, science, and social studies. The student who does not have the subjects required for admission to the Institute may take the entrance examinations given each September. Information concerning these examinations can be secured at the office of the Director of Admissions and Records, 100a Administration Building, Urbana.

### Curriculum in Aircraft Maintenance

| FIRST YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Avi. 153—Aircraft Shop Practice | 3 |
| Avi. 155—Aircraft Mathematics | 3 |
| Avi. 157—Aircraft Engine Theory and Practice | 6 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 HOURS |
|---|---|
| Avi. 101—Private Pilot Course | 3 |
| Avi. 150—Aircraft Engine Overhaul | 3 |
| Avi. 151—Applied Aircraft Physics | 3 |
| Avi. 152—Aircraft Engine Accessory Overhaul | 3 |
| Avi. 154—Aircraft Propellers | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 18 HOURS |
|---|---|
| Avi. 161—Airport Shop Management | 3 |
| Avi. 163—Aircraft Woodworking | 2 |
| Avi. 165—Aircraft Welding | 2 |
| Avi. 167—Aircraft Sheet Metal | 2 |
| Avi. 169—Aircraft Materials and Specifications | 1 |
| Avi. 171—Aircraft Finishing Methods | 3 |
| G.E.D. 105—Elements of Drawing | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 18 HOURS |
|---|---|
| Avi. 158—Aircraft Overhaul | 3 |
| Avi. 160—Aircraft Rigging and Assembly | 2 |
| Avi. 162—Aircraft Systems and Appliances | 3 |
| Avi. 164—Inspections, Forms, and Reports | 3 |
| Avi. 168—Problems of Aircraft Maintenance | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

David Kinley Hall—quarters for the College of Commerce and Business Administration.

# College of Commerce and Business Administration

Through training in modern business practices and in the fundamentals of economics, the College of Commerce and Business Administration seeks to develop in its students the abilities necessary for responsible positions in business and government. It offers a unified program of basic studies for freshmen and sophomores and a variety of fields of concentration for juniors and seniors. Though the factual contents of many of the courses are directly useful in specific vocations—accounting, banking, selling, teaching, and so forth—students should expect to serve an apprenticeship in the fields they enter after graduation from this college, if they wish to prepare themselves for higher positions. While concentrating in a special field, they are encouraged to elect courses offered in other colleges and schools of the University and to secure as liberal an education as possible to avoid the narrowing effects of overspecialization.

The program for the first and second years is organized around a nucleus of courses in accountancy and economics, mathematics and science, language and literature, rhetoric and speech. While this program is designed primarily as preparation for the third and fourth years of the curriculum, it affords a well-balanced combination of studies for those who are in college only two years in preparation for work in the business world. Students who have completed this two-year program with a satisfactory scholastic record are qualified for admission to the College of Education or to the School of Journalism and Communications, as well as to advanced work in the College of Commerce and Business Administration. Students transferring to other colleges after completing the two-year program do not receive their degrees from the College of Commerce and Business Administration, but from the college to which they transfer, on completing the requirements of that college.

In his last two years, in addition to completing the college general education requirements and the college general business education requirements, the student must complete one of the following fifteen fields of concentration: (1) accountancy, (2) commerce and law, (3) commercial teaching, (4) economics of government and business, public utilities, and transportation, (5) economic theory, (6) finance, (7) general economics, (8) industrial administration, (9) insurance, (10) labor economics, (11) management, (12) marketing, (13) personnel management, (14) secretarial training, (15) statistical economics. These fields overlap to some extent in that they deal with the common problems of business and public affairs. A student electing any one field of concentration ordinarily takes a substantial number of courses in the other fields. The program leads to the degree of Bachelor of

Science in the chosen field. For degrees from both the College of Commerce and Business Administration and the College of Law, see Commerce and Law, page 79.

A few deviations from the foregoing programs of concentration make it possible for the student to prepare for a career in foreign trade, real estate, aviation administration, administrative positions in trade associations and chambers of commerce, and so forth.

Students in this college who intend to enter the Graduate College are advised to arrange their programs so as to include the courses that are prerequisite for graduate work. Students intending to pursue work toward the doctorate are advised to acquire a reading knowledge of French and German.

## DEPARTMENTS AND DIVISIONS

Instruction in this college is organized under two departments, (1) the Department of Business Organization and Operation which is subdivided into the Divisions of Accountancy, Business Law, Management, Marketing, and Secretarial Training; and (2) the Department of Economics.

The Division of Accountancy conducts courses in general principles of accounting, auditing, cost accounting, income tax procedure, governmental accounting, budget control, and accounting systems. The Division of Business Law offers courses dealing with phases of law closely allied to business such as contracts, agency, and other subjects. The Division of Management conducts courses in the organization and administration of manufacturing industries. The Division of Marketing conducts courses in the management of distributing agencies and merchandising enterprises and in the principles and methods of advertising, marketing, and selling. The Division of Secretarial Training offers courses in advanced typewriting and shorthand, office management, records management, executive secretarial practice, office equipment, and advanced dictation and reporting.

The Department of Economics offers courses in economic history, economic theory, banking, consumer economics, economic forecasting, economics of communications, corporation finance, employment theory, fiscal and monetary theory, government-business relationships, international economics, insurance, investments, labor, personnel management, public finance, public utilities, statistics, transportation, welfare economics. The department cooperates with the Division of Social Sciences in the College of Liberal Arts and Sciences, and students in that college may make economics their major subject.

## REQUIREMENTS FOR GRADUATION

A candidate for the degree of Bachelor of Science from the College of Commerce and Business Administration must meet the following requirements:

1. Fulfill the general University requirements with reference to registration, residence, scholarship, and fees.

2. Have a total of 130 credit hours (including the prescribed military and physical education) of which not less than sixty credit hours must be in courses in accountancy, business law, economics, management, and marketing (and secretarial training courses in the fields of commercial teaching and secretarial training only), except that in commercial teaching and commerce and law the requirement is forty-five hours; and in industrial administration and personnel management fifty hours.

3. Complete the University requirements, the college general education requirements, and the college general business education requirements listed on the following pages.

4. Complete the requirements of one of the fields of concentration described subsequently.

5. Have an average of 3.0 or above for all courses counted toward graduation, whether taken at this University or elsewhere.

### HONORS AT GRADUATION

Honors awarded at graduation to superior students are designated on the diploma as Honors or High Honors. To be considered for honors, a student must have earned in residence at the University a minimum of sixty hours credit. The general University regulations for graduation with honors are given on page 28. In the College of Commerce and Business Administration one of the conditions for graduating with honors is a minimum of twelve hours of "A" in approved courses in the field of concentration.

### CURRICULA

The curriculum described in detail in the following pages became effective September 1, 1951. The curriculum in effect prior to that date is described in detail in the Undergraduate Study bulletins of 1950-1951 and prior years. A four-page pamphlet describing the old requirements may be obtained in the College office, 214 David Kinley Hall. The following rules govern the student's right to make a choice between the old and the new curriculum:

1. Students entering the College after September 1, 1951, with less than sixty hours, must meet the requirements of the new curriculum.

2. Students who entered the College before September 1, 1951, or who enter the College after that date with sixty or more hours, must elect before their next registration to meet the requirements of either the old or the new curriculum. This choice is not subject to change except for reasons acceptable to an assistant dean of the College. Forms for declaring this choice are available in the College office.

3. Students graduating after September 1, 1957, must meet the requirements of the new curriculum, unless they are delayed in their education by national emergency or for other reasons acceptable to the Dean of the College.

The principle of double counting is incorporated in the new curriculum. In other words, if a certain course appears in a field of concentration and in the college general education requirements and/or the college general business education requirements, it satisfies all of these different requirements. For example, Economics 300 counts as a required course in the field of economic theory and also toward the social economics requirement in the college general business education requirements. It will count as only three hours, however, toward the required sixty hours of commerce and the total 130 hours needed for graduation. An exception is History 101. This may be counted either in the Group of Four (first item in the college general education requirements) or in the secondary list, but not in both.

Students must register for not less than fifteen nor more than eighteen credit hours in each semester, except that freshmen and sophomores on probation are advised not to carry more than twelve academic hours. Students must take required courses in Groups I, II, and III in the semester indicated below for each course. A required course which is failed must be retaken the following semester.

## General Curriculum

| | HOURS | SEMESTER |
|---|---|---|
| I. University Requirements | | |
| Military | 4 | 1, 2, 3, 4 |
| Physical Education | 4 | 1, 2, 3, 4 |
| Rhetoric 101 | 3 | 1 |
| Rhetoric 102 | 3 | 2 |
| Hygiene 101 or 104 | 2 | 2 |
| Total University Requirements | 16 | |

| | | |
|---|---|---|
| **II. College General Education Requirements** | | |
| One of the following: | | |
| Econ. 138—Introduction to the Economic History of Modern Europe<br>Econ. 136—Economic History of the United States<br>Hist. 101—Introduction to General Social Studies<br>Geog. 105—Economic Geography | 0 to 3 | 1 or 2 |
| Speech 101—Principles of Effective Speaking | 3 | 2, 3, or 4 |
| Rhet. 151—Business Letter Writing | 3 | 3 or 4 |
| Mathematics—one of the following: | | |
| Math. A<br>College Algebra | 0 to 5 | 1 or 2 |
| Science or Advanced Mathematics | 4[3] | 1 or 2 |
| Literature or Language[4] | 6 | Literature: 3, 4, 5, or 6<br>Language: 1, 2, 3, 4, 5, or |
| Secondary List (history, philosophy, political science, psychology, sociology and anthropology)[5] | 6 | 3, 4, 5, 6, 7, or 8 |
| Additional hours in last three areas (science and advanced mathematics, language or literature, and secondary list) or additional courses in humanities (211, 212, 301, 302), or other non-commerce courses at the 100 level[6] to bring the total hours in this group to a minimum of 39 | 17 to 0 | 3, 4, 5, 6, 7, or 8 |
| Total College General Education Requirements | 39 | |
| **III. College General Business Education Requirements** | | |
| Accy. 101 or 102—Principles of Accounting | 3 or 2 | 1 |
| Accy. 105—Accounting Procedure | 3 | 2 |
| Accy. 106—Elementary Cost Accounting, or Accy. 108—Intermediate Accounting[7] | 3 | 3 |
| Bus. Law 100—Basic Principles of Business Law | 3 | 4, 5, 6, 7, or 8 |
| Econ. 102, 103—Principles of Economics | 6 | 3, 4 |
| Econ. 170—Elements of Statistics | 3 | 3 or 4 |
| Econ. 250—Money, Credit, and Banking | 3 | 5, 6, 7, or 8 |
| Econ. 254—Business Finance | 3 | 5, 6, 7, or 8 |

[1] These courses are for freshmen only and are not to be taken by students who have thirty or mor credit hours.

[2] Students presenting two units of high school algebra are exempt from this requirement. Studen presenting one unit of high school algebra must take five hours of Math. A or college algebra (Mat 111); students presenting 1½ units should take three hours of Math. A or college algebr (Math. 112).

[3] Courses to fulfill this four-hour requirement may be taken from the following subjects: astronom bacteriology, botany, chemistry, Division of General Studies (courses 131, 132, 141, 142 only) entomology, geology, mathematics (except Math. 101, 102, 103, 104, 111, 112, 117, and 161) physics, physiology, zoology.

[4] Students must obtain credit in at least six hours of English and/or American literature or obtai a reading knowledge of a modern foreign language equivalent to that resulting from four semester of study of a foreign language when commenced in college. For the purpose of this requirement candidate is assumed to have a reading knowledge of a modern foreign language if he has passed th fourth semester course (for example French 104) or a more advanced course, or if he has passed proficiency examination equivalent to the final examination given in any of these courses. If a stude has completed four years of one modern foreign language in high school, he does not have to tak any literature or foreign language or pass a proficiency examination to demonstrate a reading know edge of the language, in order to fulfill the requirements of the College of Commerce and Busines Administration. Students expecting to elect government foreign service or foreign trade (se marketing, page 81) as a field of concentration are advised to choose the foreign language optio

[5] Students in the field of secretarial training may count home economics courses in the secondary li and in the additional hours in Group II.

[6] This requirement may not be satisfied by courses in the following fields: agricultural economics air force, military, and naval science; aviation; dairy technology; engineering (all department except physics); industrial education; and physical education.

[7] Students planning to choose accountancy as their field of concentration should take both Accy. 10 and 108 in their third and fourth semesters.

| | | |
|---|---|---|
| Mgmt. 101—Industrial Organization and Management.. | 3 | 4, 5, 6, 7, or 8 |
| Mktg. 101—Principles of Marketing..... | 3 | 4, 5, 6, 7, or 8 |
| Electives from the following: Econ. 210, 214, 228, 240, 288, 300, 301, 306, 312, 336, 389..... | 6 | 5, 6, 7, or 8 |
| Total College General Business Education Requirements ..... | 38 or 39 | |
| V. Field of Concentration and Free Electives..... | 37 or 36 | |
| Total Required for Graduation..... | 130 | |

## Fields of Concentration

(Requirements are to be fulfilled during the last four semesters.)

Not more than twenty-seven hours in the designated major area (accountancy, economics, management, marketing, or secretarial training) in addition to those required in the college general business education requirements, will be accepted in meeting the total of 130 hours required for graduation. For example, a student in the accountancy area may not count toward the required 130 hours more than twenty-seven hours of accountancy in excess of the nine hours required of all students in III, college general business education requirements.

### ACCOUNTANCY

For the Degree of Bachelor of Science in Accountancy. Major area, Accountancy. For those who are preparing to follow governmental, industrial, commercial, or public accounting, or who wish to use the field of concentration in accountancy as a general training for a career in business.

Required: Accy. 106 or 108 (whichever one was not taken taken for the college business education requirements), 274, 308, 371, 377; Bus. Law 202; Rhet. 272; and at least three of the following: Accy. 221, 324, 341, 362, 366, 372, 374, 378.

Suggestions: Students preparing for a specific phase of accounting should try to take specific courses therefor in accordance with the following suggestions: For governmental accounting—Accy. 341; Econ. 214, 216. For industrial and commercial accounting—Accy. 362, 366, 374; Mgmt. 246, 301. For public accounting—Accy. 324, 372, 378; Bus. Law 301.

### COMMERCE AND LAW

For the Degree of Bachelor of Science in Commerce and Law. For those who wish to combine commercial and legal studies and obtain both the degrees of Bachelor of Science and Bachelor of Laws in six years (see also requirements for graduation from the College of Law, page 158). In their fourth year, students who have earned at least 100 credit hours of prelaw work will be regularly registered in the College of Law, but must file copies of their program cards in the office of the Dean of the College of Commerce and Business Administration at the beginning of each semester.

Primary List: Including those courses otherwise required, a sufficient number of hours shall be selected from courses offered in the College of Commerce and Business Administration to make a total of forty-five hours of courses in accountancy, economics, management, and marketing.

Technical List: Thirty hours of law.

### COMMERCIAL TEACHING

For complete program, see page 84.

### ECONOMICS OF GOVERNMENT AND BUSINESS, PUBLIC UTILITIES, AND TRANSPORTATION

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those wishing to prepare to enter public utility, transportation, or communication industries, or regulatory agencies of the government.

Required: Pol. Sci. 150, 151.

Group Electives: A total of fifteen hours selected from the following: Econ. 255 280, 288, 384, 385, 386, 389, 390, 391; Mgmt. 251, 252.

Secondary List: A student in this field must have an additional three hours in the secondary list or in courses in social sciences beyond the six hours of the secondary list courses required of all students.

Electives: A total of nine hours selected from related courses in economics, law agricultural economics, political science, or other social sciences.

#### ECONOMIC THEORY

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those who desire broad training in economic theory.

Required: Econ. 300, 301, 306.

Electives: Nine hours must be selected from courses offered by the Departments of Economics, Mathematics, Philosophy, Political Science, Psychology, and Sociology and Anthropology. These courses shall be chosen with the consent of the adviser.

#### FINANCE

For the Degree of Bachelor of Science in Finance. Major area, Economics. For those who desire a broad undergraduate preparation in public finance, banking, or business finance.

Required: Econ. 214.

Electives: At least twelve hours from the following: Econ. 215, 216, 228, 252, 253, 255, 258, 259, 301, 335.

Supplementary List: At least twelve hours in related courses, such as the following selected with the consent of an adviser in the field: Accy. 108, 274, 324, 341, 362; Agr. Econ. 302; Bus. Law 202, 301; Econ. 260, 262, 280, 288, 300, 336, 374, 375, 384, 390; Mgmt. 311; Mktg. 211, 305, 345; Pol. Sci. 150, 151, 305, 312, 351, 361, 363.

#### GENERAL ECONOMICS

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those who wish a general course of study in economics.

Required: Econ. 300.

Group Electives: To avoid overspecialization in any one field, twenty-one hours must be selected from at least four of the following eight groups. Not more than six hours may be selected from one group.

1. Economic Theory and History: Econ. 210, 213, 238, 239, 288, 301, 306, 312, 336.
2. Finance and Banking: Econ. 252, 253, 255, 258, 259, 301, 335.
3. Utilities and Transportation: Econ. 280, 287, 384, 385, 386, 389, 390.
4. Insurance and Statistics: Econ. 260, 262, 263, 271, 363, 366, 367, 371, 374, 377.
5. Foreign Trade: Econ. 224, 228, 326, 328.
6. Labor: Econ. 240, 246, 248, 342, 343, 344, 346.
7. Public Finance: Econ. 214, 215, 216.
8. Income and Consumption: Econ. 375, 378, 379, 380.

#### INDUSTRIAL ADMINISTRATION

For the Degree of Bachelor of Science in Industrial Administration. Major area, Management. For those who desire to combine commerce with engineering or with other technical work in an integrated program.

Required: Mgmt. 301; Econ. 248; Rhet. 272; at least six hours in management courses in addition to Mgmt. 101 and 301.

Technical List: At least eighteen additional hours in related technical electives appropriate to the student's course of study must be taken. At least twelve of these hours must be selected from courses in one of the following major groups, except that other selected technical majors may be permitted at the discretion of the faculty adviser in

charge of industrial administration and the Dean of the College: architecture, chemistry, dairy technology, and any one department in the College of Engineering.

General Engineering Drawing 101 and 102 up to a total of six hours may be counted toward any major.

With the consent of the faculty adviser in charge of industrial administration and the Dean of the College, the remaining maximum of six hours of technical electives may be selected from any of the above groups related to the major, or from the following minor groups: accountancy, economics courses in the field of transportation only, marketing, and theoretical and applied mechanics.

Procedure: At the time of declaring the field of concentration near the end of the sophomore year, the student must make a petition (on a form obtained in the office of the College of Commerce and Business Administration) which will include a statement of (1) the objective which prompts selection of this field, (2) applicable courses already completed, and (3) technical electives to complete the program. This petition requires the approval of the faculty adviser in charge of industrial administration and of the Dean of the College before the student's first registration upon entering this field.

#### INSURANCE

For the Degree of Bachelor of Science in Economics. Major area, Economics. For students preparing for a career in the insurance business.

Required of all students in the curriculum: Econ. 260, 262, 342.

1. For students interested in life insurance:

Required: Econ. 259, 363; Bus. Law 302.

Electives: Six hours must be taken from the following: Econ. 258, 263, 288, 366, 380; Sociol. 100; Pol. Sci. 150; Law 338; Mktg. 271, 372, 373; Math. 171, 371; Bus. Law 202.

2. For students interested in property casualty insurance:

Required: Econ. 263, 366, 367.

Electives: Six hours must be taken from the following: Econ. 258, 288, 363, 380; Bus. Law 202, 301; Mgmt. 245; Mktg. 271, 372, 373; M.E. 357; Math. 171; Pol. Sci. 150; Law 338.

#### LABOR ECONOMICS

For the Degree of Bachelor of Science in Economics. Major area, Economics. For those desiring to make a career in some phase of labor-management relations, in government service, industry, or the academic professions.

Required: Econ. 240, 246, 248, 342, 344.

Electives: Nine hours must be taken from the following: Econ. 210, 288, 343, 346, 375, 380; Psych. 145, 357; Sociol. 318; Mgmt. 362; Pol. Sci. 391.

#### MANAGEMENT

For the Degree of Bachelor of Science in Management. Major area, Management. For those who desire a broad undergraduate preparation in management.

Required: Mgmt. 301, at least nine hours in management courses in addition to Mgmt. 101 and 301; Bus. Law 202; Econ. 248; Rhet. 272.

Suggested Electives: Accy. 108, 324, 362; Econ. 210, 214, 218, 228, 240, 259, 260, 271, 300, 301, 306, 342, 344, 384, 386; any management courses not included in those required in the curriculum; Mktg. 211, 271, 281, 321, 345; Sec. Tr. 241.[1]

#### MARKETING

For the Degree of Bachelor of Science in Marketing. Major area, Marketing. For those planning to engage in any of the phases of marketing.

General Marketing. For students desiring broad general training in marketing. A minimum of twenty-one hours, including all the required courses, must be selected from:

[1] Credit earned in this course fulfills part of the sixty credit hour requirement of commerce courses. (See Requirements for Graduation, Item 2, page 76.)

Required: Mktg. 211, 271, 281, 305.

Electives: Mktg. 212, 282, 288, 315, 321, 323, 325, 331, 332, 333, 334, 345, 349, 372, 373, 382, 383, 384, 385, 386, 387; Accy. 108; Bus. Law 202; Econ. 260, 262, 263, 271, 272, 287, 288, 300, 371, 378, 379, 384; Mgmt. 204, 245, 311, 312; Rhet. 272.

For students desiring specialized training in advertising, agricultural marketing, foreign marketing, marketing research, retailing, sales and advertising management, selling, trade and commercial association management, or transportation and traffic management. A minimum of twenty-one hours must be selected from one of the following sub-fields, including all the required courses in the selected sub-field:

Advertising[1]

Required: Mktg. 271, 281, 382, 383, 384.

Electives: Mktg. 211, 288, 305, 321, 323, 386, 387; Journ. 204.

Agricultural Marketing

Required: Mktg. 271, 281, 331, 332, 333, 373.

Electives: Mktg. 211, 282, 305, 321, 334, 345, 387; Econ. 224; Mgmt. 245, 311.

Foreign Marketing

Required: Mktg. 271, 281, 305; Econ. 224, 226.

Electives: Mktg. 321, 345, 349, 372, 373; Econ. 228, 238, 260, 328, 384; foreign languages.

Marketing Research

Required: Mktg. 271, 281, 321, 323, 373; Econ. 271.

Electives: Mktg. 211, 305, 315, 325, 345, 373, 387; Accy. 108, 366; Econ. 301, 371, 373, 374, 379; Mgmt. 245; Rhet. 272.

Retailing

Required: Mktg. 211, 212, 271, 315, 345.

Electives: Mktg. 281, 282, 305, 321, 372, 384, 387; Accy. 108, Art 111, 112, 115, 185, 186; Bus. Law 202; Econ. 248, 260, 263, 378; Home Econ. 120, 125, 130, 161, 162, 180, 182, 185, 190, 262, 271, 380, 395; Mgmt. 204, 245.

Sales and Advertising Management

Required: Mktg. 271, 281, 282, 373, 387.

Electives: Mktg. 211, 212, 288, 305, 321, 323, 325, 345, 372, 383, 384, 385, 386; Econ. 248, 378; Journ. 204.

Selling

Required: Mktg. 271, 281, 345, 372, 373.

Electives: Mktg. 211, 212, 282, 288, 305, 315, 321, 349, 384, 387; Econ. 248; Mgmt. 204. Electives suggested for those interested in insurance: Bus. Law 202, 302; Econ. 260, 262, 263, 363, 366.

Trade and Commercial Association Management

Required: Mktg. 211, 321, 345, 349; Econ. 214.

Electives: Mktg. 212, 271, 281, 305, 323, 384; Econ. 216, 248, 260, 280, 288, 384; Journ. 218, 309; L.A. 271, 272; Mgmt. 245; Pol. Sci. 110, 305, 361, 362; Rhet. 272.

Transportation and Traffic Management

Required: Mktg. 271, 305, 321; Econ. 287, 384, 386.

Electives: Mktg. 281, 282, 373, 387; Bus. Law 202; Econ. 240, 248, 385; Eng. 140; Mgmt. 204, 252.

### PERSONNEL MANAGEMENT

For the degree of Bachelor of Science in Management. For those who wish to study the problems which arise out of the relationships between employer and employee, or who wish to prepare themselves for affiliation with personnel departments in industry, commerce, or public or private institutions.

Group I. The following twelve hours are required: Psych. 100, 145; Econ. 240, 248.

Group II. Nine hours must be selected from the following: Econ. 246, 344; Mgmt. 311, 362; Sociol. 318; Psych. 290; Pol. Sci. 365.

[1] A similar program is offered in the School of Journalism and Communications for journalism students majoring in advertising.

Group III. Twelve hours must be selected from any one of the three groups listed below:

Industrial: Econ. 260; Mgmt. 205, 221, 245, 301, 312; M.E. 233, 357; Psych. 338, 383. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 362; Sociol. 318; Psych. 290.

Merchandising: Econ. 288; Mgmt. 245, 312; Mktg. 211, 212, 271, 315, 373; Psych. 338, 383. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 362; Sociol. 318; Psych. 290.

Public Administration: Pol. Sci. 150, 356, 361, 362, 363; Econ. 214, 288, 344; Psych. 338, 383; Mgmt. 245. The following may be elected under this requirement provided they have not been elected in Group II above: Mgmt. 311; Sociol. 318; Psych. 290.

#### SECRETARIAL TRAINING

For the degree of Bachelor of Science in Secretarial Training. Major area, Secretarial Training. For those who wish to prepare for secretarial work requiring a high degree of technical skill and broad business education.

Required: Sec. Tr. 101, 102, 103, 111, 112, 113, 222, 233, and 241 (previous training in typewriting and shorthand will determine course level at which student begins); Econ. 248; Mgmt. 245, 246; Rhet. 272.

#### STATISTICAL ECONOMICS

For the degree of Bachelor of Science in Economics. Major area, Economics. For those who are preparing to do quantitative research in the fields of economics and business.

General Course

Required: Econ. 271, 371, 374, 377.

Technical Requirements: Math. 132, 142, 363.

Electives: Nine hours from the following: Econ. 336, 372, 373 (Econ. 372 and 373 may be substituted for Econ. 271 on the required list), 375, 376, 379; Accy. 108, 308, 324, 341, 362, 371; Mktg. 305; Math. 343, 364, 366, 369, 373.

Specialization Groups. Students wishing to prepare especially for research in one of the following specialization groups may substitute from three to twelve hours from one of the following specialization groups for the equivalent number of hours in the electives under the General Course above, and Math. 363 in the technical requirements above.

Labor Combination

Required: Econ. 240, 343, 376.

Electives: Econ. 210, 246, 248, 346, 375; Sociol. 318; Psych. 145; Mgmt. 205.

Personnel Combination

Required: Psych. 290; Econ. 240, 248.

Electives: Psych. 145; Econ. 376; Sociol. 318; Mgmt. 205, 221, 312.

Marketing Combination

Required: Mktg. 305, 321.

Electives: Mktg. 271, 281, 323, 383, 385, 386, 387; Econ. 372, 375, 379.

Finance Combination

Required: Econ. 214, 259.

Electives: Econ. 228, 260, 335, 375; Accy. 108, 308, 324, 362; Math. 371, 372; Mktg. 345.

Management Combination

Required: Courses to be announced.

Electives: Math. 368; M.E. 233; Mgmt. 205, 221, 301, 311.

Income and Consumption Combination

Required: Econ. 375, 379.

Electives: Econ. 372, 377; Anthrop. 107.

Other combinations may be approved by an adviser to adapt the program of study to training requirements in individual cases.

### NAVAL R.O.T.C.

Students who are accepted by the Naval Reserve Officers' Training Corps as candidates for Naval or Marine commissions may take the courses required to obtain such commissions at the same time they are following a regular curriculum in the College of Commerce and Business Administration. To help the student fulfill the requirements for both a bachelor's degree and a commission in eight semesters, the College of Commerce accepts certain Naval Science courses as fulfilling part of the commerce curriculum. For details write the Dean of the College of Commerce and Business Administration, Urbana, Illinois.

## Curriculum Preparatory to Teaching Commercial Subjects

**For the Degree of Bachelor of Science in Commercial Teaching**

A minimum of 130 hours of credit, counting the first two years in military and physical education, is required for graduation. A minimum of forty-five credit hours in courses in accountancy, business law, economics, management, marketing, and secretarial training is required for graduation in this field of concentration.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 TO 18 HOURS |
|---|---|
| D.G.S. 111—Verbal Communication[1] | 4 |
| D.G.S. 131—Biological Science,[2] or Bot. 100—General Botany | 4 |
| Econ. 136—Economic History of the United States, or Econ. 138—Introduction to the Economic History of Modern Europe, or D.G.S. 121—History of Civilization | 3 or 4 |
| Math. 111 or 112—Algebra, or Accy. 121—Business Computations | 3 or 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 OR 18 HOURS |
|---|---|
| D.G.S. 112—Verbal Communication[1] | 4 |
| D.G.S. 132—Biological Science, or Zool. 104—Zoology-Botany Sequence[2] | 4 |
| Econ. 136—Economic History of the United States, or Econ. 138—Introduction to the Economic History of Modern Europe, or D.G.S. 122—History of Civilization | 3 or 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 18 HOURS |
|---|---|
| Accy. 101—Principles of Accounting | 3 |
| Econ. 102—Principles of Economics | 3 |
| Geog. 105—Introductory Economic Geography | 3 |
| Sec. Tr. 101—Beginning Typewriting | 2 |
| Sociol. 100—Principles of Sociology, or Sociol. 104—Community and Society, or D.G.S. 151—Social Science | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 1 or 2 |

| | 18 HOURS |
|---|---|
| Accy. 105—Accounting Procedure | 3 |
| Econ. 103—Principles of Economics | 3 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Sec. Tr. 102—Intermediate Typewriting | 2 |
| Sec. Tr. 111—Beginning Shorthand[3] | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 |

[1] Rhet. 101, 102, and Speech 101 may be taken instead of D.G.S. 111 and 112.

[2] Recommended for teachers. In certain instances, substitutions may be chosen from the following list of sciences: astronomy, bacteriology, botany, chemistry, entomology, geology, mathematics, physics, physical science (D.G.S. 141-142), physiology, and zoology.

[3] Students not electing shorthand sequence will have these hours as electives.

**THIRD YEAR** — **17 HOURS**

| | |
|---|---|
| Accy. 106—Elementary Cost Accounting, or Accy. 108—Intermediate Accounting | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Sec. Tr. 103—Advanced Typewriting | 2 |
| Sec. Tr. 112—Intermediate Shorthand | 3 |
| Electives[1] | 2 |

**15 OR 16 HOURS**

| | |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Mktg. 271—Salesmanship, or Mktg. 281—Introduction to Advertising | 2 or 3 |
| Rhet. 151—Business Letter Writing | 3 |
| Sec. Tr. 233—Executive Secretarial Practice,[2] or Sec. Tr. 113—Advanced Shorthand,[2] or Mktg. 211—Principles of Retailing, or Accy. 108—Intermediate Accounting | 3 |
| Electives[1] | 3 |

**FOURTH YEAR** — **15 HOURS**

| | |
|---|---|
| American or English Literature, or Humanities 211—Growth of American Culture, or Phil. 104—Philosophy of Democracy, or Phil. 105—Moral Ideas and Practice | 2 to 4 |
| Bus. Law 261—Summary of Business Law | 3 |
| Pol. Sci. 150—American Government | 3 |
| Electives[1] | 5 to 7 |

**13 HOURS**

| | |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Ed. 242—Educational Practice in Secondary Education | 5 |

For the Degree of Master of Science in Commercial Teaching

**FIFTH YEAR**

A flexible graduate program for business teachers is available. Majors and minors may be taken either in the College of Commerce and Business Administration or in the College of Education. For information regarding these programs, write to the Chairman of the University Committee on the Preparation of Secondary School Teachers of Commerce, College of Commerce and Business Administration, Urbana, Illinois.

## Teacher Education Minors in Commerce

### Shorthand and Typewriting[3]

| | HOURS |
|---|---|
| Sec. Tr. 101, 102, 103—Typewriting | 6 |
| Sec. Tr. 111, 112—Shorthand[4] | 6 |
| Rhet. 151—Business Letter Writing | 3 |
| Mgmt. 246—Office Equipment | 3 |
| Total | 18 |

[1] Suggested electives are: Econ. 250, 254; Mgmt. 101, 245, 246; Mktg. 212, 281, 372; Psych. 150, 255. Electives shall be chosen with the consent of the adviser. Students preparing to be supervisors and/or coordinators of cooperative programs will be required to take a minimum of eight semester hours of professional preparation to include Ed. 381, Principles of Vocational Education, 3 hours; Ed. 355, The Cooperative Program in Business Education, 3 hours; Ed. (new), Problems of Coordinating Business Education Programs, 2 hours.

[2] Students not electing shorthand sequence will have these hours as electives.

[3] Students with previous instruction in shorthand and typewriting must confer with advisers in commercial teaching in the College of Commerce and Business Administration, Room 2, David Kinley Hall.

[4] In addition to Sec. Tr. 111 and 112, 113 and 233 are strongly recommended.

## Bookkeeping

| | |
|---|---|
| Accy. 101 or 102—Principles of Accounting | 3 or 2 |
| Accy. 105—Accounting Procedure | 3 |
| Accy. 106—Elementary Cost Accounting | 3 |
| Accy. 108—Intermediate Accounting | 3 |
| Electives (Accy. 121—Business Computations; Accy. 308—Advanced Accounting; Bus. Law 201-202—General Principles of Business Law; Mktg. 101—Principles of Marketing) | 4 or 5 |
| Minimum Total | 16 |

## General Commerce

| | |
|---|---|
| Accy. 121—Business Computations | 3 |
| Accy. 201—Fundamentals of Accounting | 3 |
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 108—Elements of Economics | 3 |
| Mgmt. 101—Industrial Organization and Management | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| Total | 18 |

Between classes at Gregory Hall.

# College of Education

The College of Education prepares students for careers in teaching, special educational services, and administration. Courses and curricula offered at the undergraduate level lead to teacher certification. The courses of study are supplemented by supervised practice in teaching in school systems cooperating with the college.

Candidates for baccalaureate degrees in the College of Education take certain required courses and elect other courses in this college. They prepare themselves further for their chosen teaching fields by concentrating in restricted groups of subjects in other colleges and schools of the University. For those who wish to concentrate in the fields of elementary education, home economics education, education of deaf and hard-of-hearing children, education of mentally handicapped children, or industrial education, specialized curricula are provided in this college, each leading to the degree of Bachelor of Science. In the fields of other teaching subjects, sequences of courses comparable to these curricula are arranged for individual students by advisers.

## REQUIREMENTS FOR ADMISSION

The curricula in the education of deaf and hard-of-hearing children, education of mentally handicapped children, elementary education, and industrial education begin with the first year. Junior standing and an average of 3.5 are required for admission to all other curricula. The two years of study required for admission may be completed in any college approved by the University. Juniors entering from the College of Liberal Arts and Sciences should have completed the prescribed subjects and group requirements of the general curriculum or the first two years of work in the Division of General Studies. A junior entering from any other college of the University should have completed the first two years of a regular curriculum, and anyone transferring from another institution must have acceptable credit for an equivalent amount of work in that institution.

Students in the College of Education who are preparing for graduate work should arrange their undergraduate programs to meet the requirements for admission to the Graduate College. Special programs leading to the degrees of Master of Education, Advanced Certificate in Education, and Doctor of Education are described in the catalog of the Graduate College.

## REQUIREMENTS FOR GRADUATION

Each candidate for a baccalaureate degree in the College of Education, must meet the general University requirements with reference to registration, residence, fees, hygiene, military training, physical education, and rhetoric. Students who are preparing for elementary education, home economics education, education of deaf and hard-of-hearing children, education of mentally handicapped children, or industrial education must meet the specific requirements of their curriculum with a satisfactory scholastic average. Students who are preparing for other teaching fields must secure credit, with a satisfactory scholastic average, in approved courses totaling at least 120 semester hours, including the credit accepted for admission to this college, but not counting the first two years of required work in military and physical education.

### HONORS AT GRADUATION

To be eligible for graduation with honors, a student must have earned in residen the final 64 semester hours of credit. A student who achieves a specific scholastic avera in all work presented for graduation and in all courses in education may be reco mended for honors as follows: a scholastic average of not less than 4.25, graduation wi Honors; a scholastic average of not less than 4.5, graduation with High Honors; a schola tic average of not less than 4.75, graduation with Highest Honors.

### PRESCRIBED SUBJECTS

Twenty hours in education, including the following courses: Foundations of Am ican Education, 2 hours; Educational Psychology, 3 hours; Technic of Teaching in t Secondary School, 3 hours; a teachers' course in the subject of specialization, 2 hou Principles of Secondary Education, 2 hours; and Educational Practice, 5 hours. (A 3 average is prerequisite to Educational Practice.)

### SUBJECTS OF SPECIALIZATION

Students who are preparing for elementary education, home economics educatio education of deaf and hard-of-hearing children, education of mentally handicapped ch dren, or industrial education follow the special curriculum in their field.

Students who are preparing for other teaching fields must specialize in two or thr subjects selected from the following list. A student who elects to specialize in two su jects must complete at least thirty-two hours of approved courses in his first subject specialization and at least sixteen hours of approved courses in his second subje of specialization. A student who elects to specialize in three subjects must complete least twenty hours of approved courses in his first subject of specialization, and at le sixteen hours of approved courses in his second and third subjects of specialization. computing the hours in the subjects of specialization, courses taken in other colleg prior to admission may be counted.

**Art**

**Biology** (a well-balanced program selected from zoology, physiology, entomology, botany, bacteriology. For a first subject of specialization, 25 to 32 hours are required; and for a second subject of specialization, 18 to 22 hours are required)

**Chemistry**

**Civics** (includes political science and sociology with a minimum of 8 hours in either subject)

**Commercial Subjects** (includes accountancy, business law, business letter writing, management, marketing)

**Economics**

**English** (includes courses in English literature, American literature, and rhetoric)

**French**

**General Science** (from 32 to 35 hours of beginning sciences for a first subject of specialization; from 20 to 25 hours for a second subject; the total should include at least one year of work in the physical sciences and one year in the biological sciences)

**Geography** (includes geology)

**German**

**History**

**Home Economics**

**Industrial Education** (includes industr arts)

**Journalism** (as a second or third subject specialization)

**Latin**

**Library Science**

**Mathematics**

**Music**

**Physical Education for Men**

**Physical Education for Women**

**Physics** (includes courses in theoretical a applied mechanics)

**Physiology** (includes Hygiene 110)

**Spanish**

**Speech** (a minimum of 16 hours in spee the remainder may be English literat and American literature)

NOTE: All students are urged to confer with a placement consultant in the Office of Teacher Placement concerning the combinations of subjects most frequently requested by the high schools of the state and the standard preparation usually demanded.

### ELECTIVES

The remainder of the curriculum may be elected, with approval of the student's adviser, from courses offered by other colleges and schools in the University.

## Curriculum Preparatory to Teaching in the Elementary School

**For the Degree of Bachelor of Science in Elementary Education**

This four-year curriculum is designed to meet the requirements for teaching in the elementary and kindergarten-primary grades of Illinois schools. A minimum of 124 semester hours, exclusive of required physical education and military training, are necessary for graduation under this curriculum.

For admission to the curriculum, freshmen must meet the general entrance requirements for admission to the University. In general, admission of transfer students, either from other institutions or from other colleges of the University of Illinois, is limited to students having a grade-point average of 3.5 or higher, in terms of the University of Illinois grading system. Admission of transfer students whose scholastic average is below 2.5 is considered on petition in individual cases. Petitions for admission are considered by a committee which makes recommendations to the Dean of the College of Education.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

### SUMMARY

| | HOURS |
|---|---|
| **Language Arts** | |
| Rhet. 101, 102, and Speech 101 (or 141), or D.G.S. 111 and 112 | 8 to 9 |
| Engl. 101, 102, and 103, or Engl. 113 and 114, or Engl. 121 and 122 | 6 to 8 |
| Lib. Sci. 303 | 3 |
| Elective in Language Arts Area | 0 to 3 |
| Total Required | 20 |
| **Natural Science** | |
| Biological Science (ten hours required): | |
| Bot. 100 and Zool. 104, or D.G.S. 131 and 132, or Entom. 103 and Bot. 100, or Entom. 103 and Zool. 104 | 8 |
| Hygiene 101 | 2 |
| Physical Science (eight hours required): | |
| D.G.S. 141 and 142, or an approved sequence of eight hours from astronomy, geology, physical geography, chemistry, and physics | 8 |
| Total Required | 18 |
| **Psychology 100** | 4 |
| **Social Science** | |
| D.G.S. 151 and 152, or Hist. 111 and 112, or Phil. 103 and 104, or Sociol. 104 and 105 | 8 |
| Geog. 104 | 3 |
| Hist. 152 | 3 |
| Pol. Sci. 150 | 3 |
| Elective from Social Science Area | 3 |
| Total Required | 20 |

Mathematics 202 .....

Health and Physical Education
Required Physical Education .....
P.E.W. 220 .....

Total Required .....

Fine and Applied Arts
Art 115, 170, 171, 173, 175, or 177 ..... 2 c
Art 203 .....
Ed. 337 .....
Music 212 and 213 .....

Total Required ..... 13 or

Professional Courses in Education (101, 201, 230, 231, 232, 233, 236, 237, and 336) .....
Electives (exclusive of above area electives) ..... 17 or
Persons preparing for the kindergarten-primary certificate will be required to take the following six hours in addition to the above:
Ed. 234 .....
Ed. 235 or S.W. 316 .....

## Curriculum in Art Education

For the Degree of Bachelor of Fine Arts in Art Education (see page 135)

## Curriculum in Home Economics Education

For the Degree of Bachelor of Science in Home Economics Education

This four-year curriculum, totaling 120 semester hours, is designed to meet the quirements for certification of teachers of home economics by the State Superintend of Public Instruction. The first two years of work in this curriculum may be taken in College of Agriculture (see page 64), or in the College of Liberal Arts and Sciences ( page 166), or in any other college approved by the University. The third and fou years may be taken in the College of Education by students who meet requirements r admission to this college.

### SUMMARY

Those who wish to meet the requirements of the State Board for Vocational Edu tion should see the curriculum in vocational home economics education on page 67.

| | HC S |
|---|---|
| Art 185, 186 | 4 |
| Bact. 104[1] | 5 |
| Chem. 101 or 102, 132 | 6 8 |
| Econ. 108 | 3 |
| Education: | |
| Vocational: Ed. 101, 201, 211, 240, 241, 242; Home Econ. 277 | 3 |
| Non-vocational: Ed. 101, 201, 211, 240, 241, 242; Home Econ. 277 | 0 |
| Hist. 152 | 3 |
| Home Economics: | |
| Vocational: Home Econ. 130, 131, 161, 162, 170, 180, 182, 185, 186, 201, 202, 210, 220, 228, 232, 272, 273, 286 | 3 |
| Non-vocational: Home Econ. 130, 131, 161 or 162, 170, 180, 185, 201, 232, 272, and a minimum of seven hours from 186, 202, 220, 273, 286, 305 | 32 to 1 |
| Hygiene 101 | 2 |
| Physical Education (four semesters) | 0 |
| Physiol. 103[1] | 4 |

[1] Each student must take at least eight hours in physiology and bacteriology.

| | |
|---|---|
| ol. Sci. 150 | 3 |
| sych. 103 | 4 |
| het. 101, 102, and Speech 101, or D.G.S. 111 and 112 | 8 or 9 |
| ociol. 100 | 3 |
| Total Required for Graduation | 120 |

## urriculum in Industrial Education

**For the Degree of Bachelor of Science in Industrial Education**

A minimum of 127 hours of credit, not counting the first two years of work in hysical education and military, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are n the campus during the spring semester prior to the year they expect to enroll in stu- nt teaching must apply for admission to Educational Practice during February of that mester. Students who are not on the campus during the spring semester prior to the ar they expect to enroll in student teaching are allowed to apply during the first three eeks of the fall semester. Application forms may be obtained in the Office of Student eaching, 208 Gregory Hall.

| RST YEAR FIRST SEMESTER | 16 TO 18 HOURS |
|---|---|
| t 137—Design Analysis | 2 |
| .E.D. 101—Elements of Drawing | 4 |
| ygiene 104—Personal and Community Hygiene | 2 |
| d. Ed. 181—Industrial Arts | 4 |
| het. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| hysical Education | 1 |
| ilitary (men) | 1 |

| SECOND SEMESTER | 16 TO 19 HOURS |
|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ind. Ed. 183—General Metal Work | 4 |
| Math. 112—College Algebra, and Math. 114—Plane Trigonometry, or Math. 117—Combined Freshman Mathematics | 5 |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Speech 101—Principles of Effective Speaking[1] | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| COND YEAR | 17 OR 18 HOURS |
|---|---|
| G.S. 131—Biological Science | 4 |
| G.S. 141—Physical Science | 4 |
| d. Ed. 282—Advanced Course in Woodwork | 4 |
| ych. 100—Introduction to Psychology | 4 |
| hysical Education | 1 |
| ilitary (men) | 1 |

| | 16 OR 17 HOURS |
|---|---|
| D.G.S. 142—Physical Science | 4 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Ind. Ed. (new)—Graphic Arts | 3 |
| Pol. Sci. 150—American Government | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 |

| IRD YEAR | 17 HOURS |
|---|---|
| ch. 141—Materials and Methods of Construction | 2 |
| G.S. 121—History of Civilization, or D.G.S. 161—Literature and Fine Arts | 4 |
| on. 108—Elements of Economics | 3 |
| d. Ed. 284—Advanced Metal Work | 4 |
| ctives | 4 |

| | 18 HOURS |
|---|---|
| D.G.S. 122—History of Civilization, or D.G.S. 162—Literature and Fine Arts | 4 |
| Econ. 240—Labor Problems | 3 |
| Ed. 201—Foundations of American Education | 2 |
| Ind. Ed. 285—General Electricity | 3 |
| Shop Electives | 4 |
| Electives | 2 |

[1] Students who take D.G.S. 111 and 112 are not required to take Speech 101.

| FOURTH YEAR | 17 HOURS |
|---|---|
| Ed. 381—Principles of Vocational Education | 3 |
| Ind. Ed. (new)—General Shop | 3 |
| Shop Electives | 7 |
| Electives | 4 |

| | 14 HOU |
|---|---|
| Ed. 211—Educational Psychology | |
| Ed. 241—Technic of Teaching in the Secondary School | |
| Ed. 242—Educational Practice in Secondary Education | |
| Ed. 383—Problems of Industrial Education | |

## Curriculum Preparatory to Teaching Deaf and Hard-of-Hearing Children

For the Degree of Bachelor of Science in the Education of the Deaf

A student who wishes to enter the curriculum for the education of the deaf and t hard-of-hearing must (1) rank in the upper 25 per cent of his high school graduati class or, if a transfer student, must have an average of at least 3.5; and (2) possess n mal hearing acuity and normal formation of the teeth and lips. A personal interview w a staff member of the College of Education is required.

A minimum of 124 hours of credit, not counting the first two years of work in m tary and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who on the campus during the spring semester prior to the year they expect to enroll in s dent teaching must apply for admission to Educational Practice during February of t semester. Students who are not on the campus during the spring semester prior to t year they expect to enroll in student teaching are allowed to apply during the first th weeks of the fall semester. Application forms may be obtained in the Office of Stud Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 15 TO 19 HOURS |
|---|---|
| D.G.S. 131—Biological Science, or Physiol. 110-111—Elementary Mammalian Physiology[1] | 4 or 5 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Speech 101—Principles of Effective Speaking[2] | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 4 or 5 |

| SECOND SEMESTER | 16 TO 20 HO |
|---|---|
| D.G.S. 132—Biological Science, or Physiol. 106—Physiology of the Nervous System and the Special Senses | 4 o |
| Hygiene 101—Health Lectures | |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 o |
| Physical Education | |
| Military (men) | |
| Electives | 7 o |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| D.G.S. 151—Social Science[3] | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 16 OR 17 HO |
|---|---|
| D.G.S. 152—Social Science[3] | |
| D.G.S. 162—Literature and Fine Arts | |
| Ed. 101—The Nature of the Teaching Profession | |
| Hist. 152—History of the United States, 1865-1952 | |
| Physical Education | |
| Military (men) | |
| Electives | |

[1] This requirement will be waived for students who have completed general zoology or an accepte equivalent.

[2] Students who take D.G.S. 111 and 112 are not required to take Speech 101.

[3] D.G.S. 151 and 152 will be waived for students who have completed Sociol. 100 and one additio three-hour course in sociology.

| HIRD YEAR | 17 OR 18 HOURS |
|---|---|
| rt 203—Art Education Laboratory, or Arts and Crafts Electives[1] | 2 |
| d. 236—Child Development for Elementary Teachers | 3 |
| d. 317—Exceptional Children | 3 |
| peech 301—Introduction to Phonetics | 3 |
| peech 385—Speech Correction | 4 |
| ectives[2] | 2 or 3 |

| | 17 HOURS |
|---|---|
| Ed. 218—Remedial Reading in the Elementary School | 3 |
| Ed. 230—Principles of Elementary Education | 2 |
| Ed. 237—Child Development for Elementary Teachers | 3 |
| Speech 375—Speech Science | 3 |
| Speech 395—Audiometry and the Use of Hearing Aids | 3 |
| Electives[2] | 3 |

| OURTH YEAR | 15 OR 16 HOURS |
|---|---|
| d. 220—Educational Practice in the Education of Exceptional Children | 3 |
| d. 231—Technic of Teaching in the Elementary School | 3 |
| d. 232—Educational Practice in Elementary Education | 2 |
| d. 319—Special Education of the Deaf | 5 |
| ectives[2] | 2 or 3 |

| | 15 OR 16 HOURS |
|---|---|
| Ed. 220—Educational Practice in the Education of Exceptional Children | 5 |
| Ed. 320—Special Education of the Deaf | 5 |
| Ed. 324—Mental and Educational Measurement of Exceptional Children | 3 |
| Electives[2] | 2 or 3 |

For the Degree of Master of Science in the Education of the Deaf

FTH YEAR

For admission to the curriculum for the degree of Master of Science in the Education the Deaf, one of the following prerequisites is necessary: (1) a bachelor's degree in ementary or special education (other than the education of the deaf); or (2) a achelor's degree in education of the deaf from an accredited training center for teachers the deaf.

Candidates for the degree must earn a minimum of eight units as follows:

| | UNITS |
|---|---|
| . Required of all students: | |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| . Required of students qualified under prerequisite 1: | |
| Ed. 317—Exceptional Children | ½ |
| Ed. 319—Special Education of the Deaf | 1 or 1½ |
| Ed. 320—Special Education of the Deaf | 1 or 2 |
| Speech 301—Introduction to Phonetics | ½ |
| Speech 385—Speech Correction | ½ |
| Speech 395—Audiometry and the Use of Hearing Aids | ½ |
| Required of students registered under prerequisite 2: | |
| Ed. 418—Problems in Communication for the Deaf | 1 |
| Ed. 449—Independent Study | 1 |
| Electives to be chosen from the following: | |
| Ed. 381—Principles of Vocational Education | 1 |
| Ed. 412—Advanced Child Development for Students of Education | 1 |
| Ed. 425—Educational and Vocational Guidance | 1 |
| Ed. 426—Diagnostic and Remedial Programs of the School | 1 |

tudents may satisfy this requirement by taking Ind. Ed. 181, or by taking four hours selected m Art 170, Home Econ. 196, or the equivalent.

lectives should be selected with consent of adviser. A maximum of forty-four hours in education l be allowed toward graduation.

Ed. 430—Elementary School Organization and Administration
Ed. 438—Supervision of the Elementary School
Ed. 440—Administration and Supervision of Junior and Senior High Schools
Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education
Ed. 460—Educational Administration
Psych. 443—Psychodiagnosis I
Psych. 461—Advanced Child Psychology
Speech 375—Speech Science
Speech 388—Speech Correction
Speech 488—Diagnosis of Speech Disorders
Speech 489—Seminar in Organic Speech Disorders

## Curriculum Preparatory to Teaching Mentally Handicapped Children

For the Degree of Bachelor of Science in the Education of Mentally Handicapped Children

A student who wishes to enter the curriculum for the education of the menta handicapped must (1) rank in the upper 25 per cent of his high school graduating cl or, if a transfer student, must have an average of at least 3.5; and (2) possess norm hearing acuity and normal formation of the teeth and the lips. A personal interview w a staff member of the College of Education is required.

A minimum of 124 hours of credit, not counting the first two years of work in m tary and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who on the campus during the spring semester prior to the year they expect to enroll in s dent teaching must apply for admission to Educational Practice during February of t semester. Students who are not on the campus during the spring semester prior to t year they expect to enroll in student teaching are allowed to apply during the first th weeks of the fall semester. Application forms may be obtained in the Office of Stud Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 15 TO 18 HOURS |
|---|---|
| Arts and Crafts[1] | 4 |
| D.G.S. 131—Biological Science, or Physiol. 110-111—Elementary Mammalian Physiology[2] | 4 or 5 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| SECOND SEMESTER | 15 TO 18 HO |
|---|---|
| D.G.S. 132—Biological Science, or Physiol. 106—Physiology of the Nervous System and the Special Senses | 4 c |
| Hygiene 101—Health Lectures | |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 c |
| Speech 101—Principles of Effective Speaking[3] | |
| Physical Education | |
| Military (men) | |
| Electives | |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| D.G.S. 151—Social Science[4] | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 16 OR 17 HO S |
|---|---|
| D.G.S. 152—Social Science[4] | |
| D.G.S. 162—Literature and Fine Arts | |
| Ed. 101—The Nature of the Teaching Profession | |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Physical Education | |
| Military (men) | |
| Electives | 2 |

[1] Students may satisfy this requirement by taking Ind. Ed. 181, or by taking four hours selected f Art 170, 203, Home Econ. 196, or the equivalent.

[2] This requirement will be waived for students who have completed general zoology or an accept equivalent.

[3] Students who take D.G.S. 111 and 112 are not required to take Speech 101.

[4] D.G.S. 151 and 152 will be waived for students who have completed Sociol. 100 and one additi three-hour course in sociology.

| THIRD YEAR | 16 OR 17 HOURS |
|---|---|
| Ed. 236—Child Development for Elementary Teachers | 3 |
| Ed. 317—Exceptional Children | 3 |
| Ed. 324—Mental and Educational Measurement of Exceptional Children, or Psych. 150—Character and Personality, or Psych. 283—Psychology of Adjustment | 3 or 4 |
| Speech 385—Speech Correction,[1] or Speech 208—Classroom Problems in Speech Correction | 3 |
| Electives | 4 |

| | 15 TO 17 HOURS |
|---|---|
| Ed. 218—Remedial Reading in the Elementary School | 3 |
| Ed. 230—Principles of Elementary Education, or Ed. 240—Principles of Secondary Education | 2 |
| Ed. 237—Child Development for Elementary Teachers | 3 |
| Electives | 7 to 9 |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Ed. 231—Technic of Teaching in the Elementary School | 3 |
| Ed. 232—Educational Practice in Elementary Education[2] | 5 |
| Ed. 322—Psychology and Education of the Mentally Handicapped | 3 |
| Electives[3] | 5 |

| | 16 OR 17 HOURS |
|---|---|
| Ed. 220—Educational Practice in the Education of Exceptional Children | 5 |
| Ed. 323—Psychology and Education of the Mentally Handicapped | 3 |
| Electives[3] | 8 or 9 |

For the Degree of Master of Science in the Education of Mentally Handicapped Children

| FIFTH YEAR | UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 317—Exceptional Children | ½ |
| Ed. 322—Psychology and Education of the Mentally Handicapped | ½ |
| Ed. 323—Psychology and Education of the Mentally Handicapped | ½ |
| Ed. 426—Diagnostic and Remedial Programs of the School | 1 |
| Electives | 3½ |
| Total | 8 |

Electives should be chosen from the following (under special circumstances, other courses may be substituted with the approval of the adviser):

Ed. 390—Elements of Educational Statistics
Ed. 411—Psychology of Adolescence for Teachers
Ed. 412—Advanced Child Development for Students of Education
Ed. 417—Administration and Supervision of Education of Exceptional Children
Ed. 433—Curriculum Problems and Trends in Special Fields of Elementary Education
Psych. 338—Abnormal Psychology
Psych. 406—Quantitative Methods
Psych. 411—Advanced Physiological Psychology
Psych. 445—Psychodiagnosis and Psychotherapy
Psych. 461—Advanced Child Psychology
Psych. 467—Personality Theory
Psych. 493-494—Research Seminar
Speech 385—Speech Correction
Speech 388—Speech Correction

[1] Speech 301 is a prerequisite or can be taken concurrently with Speech 385.

[2] Educational practice will be with normal elementary children and with mentally retarded elementary children.

[3] Electives will be selected with the consent of the adviser. A maximum of forty hours in education will be allowed toward graduation.

## Curriculum in Music Education

For the Degree of Bachelor of Science in Music Education (see page 141)

## Curriculum in Physical Education for Men

For the Degree of Bachelor of Science in Physical Education (see page 220)

## Curriculum in Physical Education for Women

For the Degree of Bachelor of Science in Physical Education (see page 222)

## Certification of Teachers

The University's Office of Teacher Placement, in response to requests from schoo authorities, recommends qualified graduates of the University for positions as teachers an supervisors in public schools, colleges, and technical schools. Applicants should consu the head of teacher placement in 200 Gregory Hall.

Each applicant for a position in the schools of Illinois, on completing his work in th University, should have a transcript of his record sent by the Office of the Recorder t the State Superintendent of Public Instruction at Springfield. When he has obtained position he should apply for a certificate through the office of the superintendent schools in the county in which he is to teach. The requirements now in effect for th kinds of certificates most frequently needed by graduates of the University are as follow

A limited high school certificate, valid for four years for teaching in grades seven t twelve of the common schools, may be issued to prospective teachers who have graduate with a bachelor's degree from a recognized college or who present certified evidenc accompanied by faculty recommendation, of having completed the requirements belo This certificate is renewable in periods of four years upon successful teaching and pr fessional growth satisfactory to the county superintendent of schools.

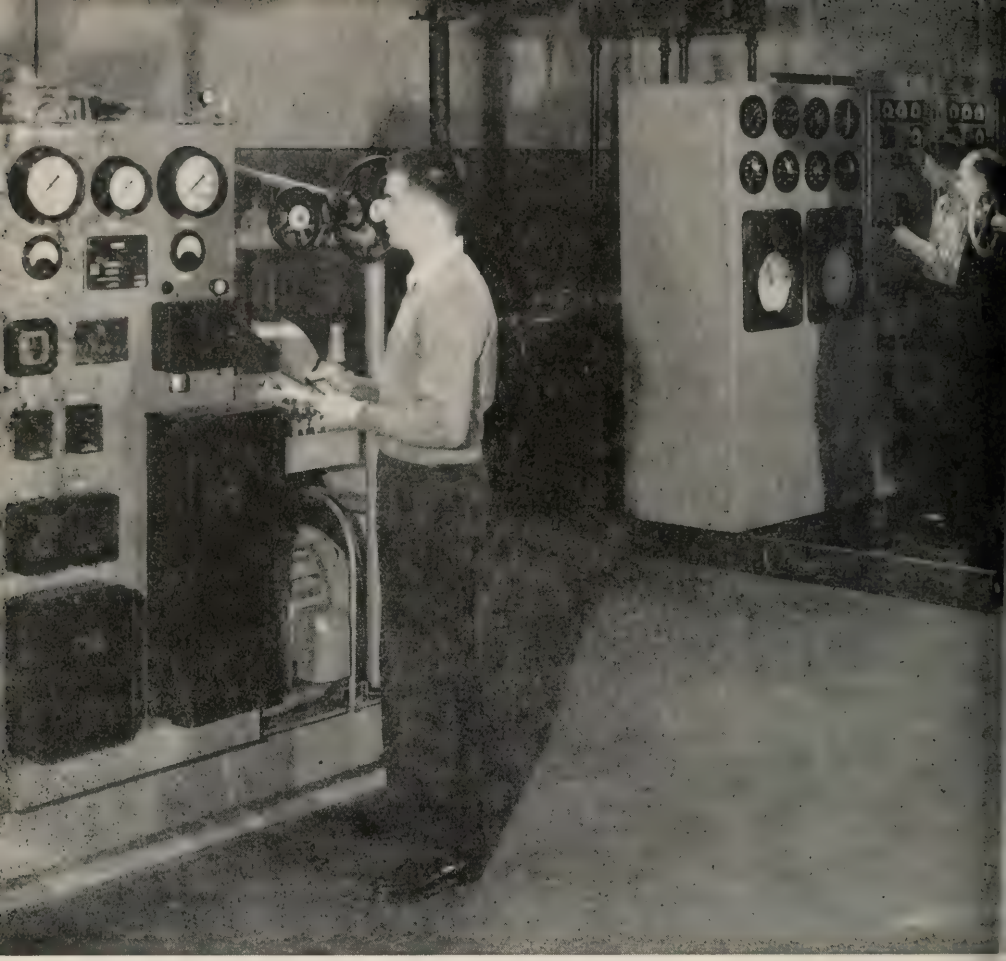
| | HOU |
|---|---|
| I. General Education | |
| (a) Oral and Written Expression | 8 |
| (b) Natural Science | 6 |
| (c) Social Science (including a course in American history and or government) | 6 |
| (d) Humanities | 6 |
| (e) Health and Physical Education | 3 |
| (f) Additional work in any of the above fields | 6 |
| II. Education (Professional) | |
| (a) Adolescent Growth and Development | 2 or 3 |
| (b) Principles or Philosophy of Education (including the study of professional ethics) | 2 or 3 |
| (c) Student Teaching (high school level) | 5 |
| (d) Materials and Methods in the Secondary School, or Methods of Teaching a Particular Secondary School Subject | 2 or 3 |
| (e) American Public Education | 2 or 3 |
| (f) Electives in Professional Education | |
| III. Electives | |
| IV. One Major Area of Specialization | |
| V. One Minor Area of Specialization | |
| Total | 1 |

Three minors, two of which are in related fields, will be accepted in lieu of o minor and one major.

A life high school certificate, valid for teaching and supervising in grades seven twelve of the common schools, may be granted to those fulfilling the following requi ments: A master's degree conferred by a recognized college or university, credit

twenty-two semester hours in education, and four years of successful teaching experience, two of which must have been in the state of Illinois.

Statements of the requirements for other types of certificates may be found in the University of Illinois Bulletin, *If You Want to Be a Teacher.*



Mechanical engineering students in the unit power plant.

# College of Engineering

The College of Engineering aims to prepare men for professional work in engineering and for responsible positions of a technical and semitechnical character in industry, commerce, and government. The college provides training in the mathematical and physical sciences and their applications to the design, construction, and operation of industrial plants and public and private works of all kinds. The curricula, though widely varied and specialized, are built on a general foundation of scientific facts and theories applicable to many different fields. Work in the classrooms, laboratories, shops, and drafting rooms is correlated by practical problems which the students solve by methods similar to those of practicing engineers.

While each student pursues a curriculum of his own choice according to the field of his particular interest, all the students take certain courses in common. Basic courses in mathematics, chemistry, physics, rhetoric, and drawing are required in the first two years. Although the curricula are progressively specialized in the third and fourth years, each student is required to take some courses outside his chosen field.

In addition to those studies that are obviously technical in nature, there are certain supporting courses that may contribute materially to the engineer's general usefulness. The College of Engineering offers a sequence of courses that deals with such topics as the development and supervision of industry and of transportation systems, labor relations, and engineering law. This area may be further explored by course work in the College of Commerce and Business Administration. These semitechnical subjects may be required or elective, depending upon the objectives of the particular curriculum.

Nontechnical courses are included in each curriculum; they may be required or elective. Many of the nontechnical courses satisfy the broad objectives of the socio-humanistic stem of engineering curricula; in particular, (1) that of making the student keenly aware of the urgent problems of society, and (2) that of developing a deeper appreciation of the cultural achievements of man. The socio-humanistic courses are usually drawn from the many offerings in liberal arts and sciences, economics, and certain approved sequences in fine and applied arts, education, and journalism.

All departments in this college, except General Engineering Drawing, offer graduate degrees. Some of the advanced undergraduate courses in each department may be taken for graduate credit. Detailed information on graduate programs may be obtained from the bulletin of the Graduate College.

The Engineering Library on the first and second floors of Civil Engineering Hall contains the reference books, periodicals, catalogs, and technical publications which the students need constantly, and also provides for general reading and private research.

### REQUIREMENTS FOR GRADUATION

Students in the College of Engineering who meet the University's general requirements with reference to registration, residence, and fees, and who maintain satisfactory scholastic records in this college, are awarded degrees appropriate to their curricula. Each curriculum requires a minimum of 136 semester hours of credit, not counting the required work in military training and physical education.

Each curriculum leads to the degree of Bachelor of Science and may ordinarily be completed in four years. A graduate of one curriculum ordinarily can qualify for another baccalaureate degree by doing a fifth year of work, consisting of thirty to thirty-six semester hours, providing plans have been made looking toward such an arrangement at the beginning of his third year.

A graduate of the College of Liberal Arts and Sciences, or any other college of equal standing, who has adequate training in mathematics, physics, and mechanics to enable him to begin the third year of a curriculum in the College of Engineering, can usually qualify for the degree of Bachelor of Science from this college by two and one-half years of work.

The degree of Bachelor of Naval Science is provided for those students enrolled in the N.R.O.T.C. program as engineers, who wish to terminate their curricular work at the end of the eight semesters. Nine semesters are required to earn the Bachelor of Science degree with engineering designation in any curriculum in the college in this program.

### SPECIAL REQUIREMENTS

**Foreign Language.** In any curriculum requiring French or German, a student who has been admitted to the University with credit for one or more years of secondary school work in either or both of these languages may count each unit of his entrance credit as equivalent to one semester of university work in excusing him from the required language. Only whole units may be so counted. In the place of the language requirement thus fulfilled, the student must take additional electives approved by the faculty of this college.

**Inspection Trips.** Seniors in the College of Engineering are required to make a trip for inspection of industrial establishments and engineering enterprises in the fields of their major interests. The students who are about to be graduated, and other students who obtain permission of the general committee in charge of this trip, travel in groups under the supervision of faculty members. The trip usually occupies from three to four days and involves an expense of approximately $20 to each student.

**Thesis.** A senior of high standing in any curriculum, with the approval of the department concerned, may substitute for one or more technical courses an investigation of a special subject and write a thesis on his results.

### DEPARTMENTS AND CURRICULA

The College of Engineering includes the departments of Aeronautical Engineering, Ceramic Engineering, Civil Engineering, Electrical Engineering, General Engineering Drawing, Mechanical Engineering, Mining and Metallurgical Engineering, Physics, and Theoretical and Applied Mechanics. The undergraduate curricula described below are administered by these departments. The work in chemical engineering is administered by the College of Liberal Arts and Sciences. The curriculum in general engineering is administered by the dean of the college directly. The curriculum in agricultural engineering is administered jointly by the Colleges of Agriculture and Engineering.

Courses in general engineering drawing are given for students in all curricula. This department has offices and drafting rooms in the Transportation Building.

Each student entering the College of Engineering declares his choice of a curriculum. Except where stated in the outline of a curriculum, all first-year students follow the common programs for freshmen shown on pages 108 and 109.

At the beginning of any semester of the first two years, any student is free to change from one curriculum to another without loss of much, if any, credit for the work he has done. Students who are not far advanced in this college may transfer to other colleges without much loss of time in their progress toward degrees.

**Special Curricula.** Students of high scholastic achievement, with exceptional aptitudes and interests in special fields of engineering science and its application, may be permitted to vary the course content of the standard curriculum of the department in which they are registered, with the purpose of emphasizing some phases which are not included in the standard curriculum or which can not be encompassed by the usual procedure of course substitution and selection of electives. These unwritten curricula, however, include all the fundamental courses of the standard curricula, the variations being made mainly in the so-called "applicatory" portions of the standard curricula of the college. The program of studies of each student permitted to take such a special curriculum must be approved by a committee of the college, of which the associate dean is chairman, in consultation with the head of the department in which the student is registered, and with a professor of the college particularly interested in the field which the student intends to emphasize. This professor automatically becomes the student's adviser in charge of registration and other matters pertaining to the approved program.

**Aeronautical Engineering.** The curriculum in aeronautical engineering is offered to train students in the basic principles of airframe and aircraft power plant design and construction. The course work provides sound training in fundamentals which may be applied to related engineering fields. Provisions for elective courses enable the student to pursue advanced undergraduate study in the fields of aerodynamics, aircraft structures, aircraft power plants, design, and production. Graduate study and research may also be undertaken in these divisions.

The aeronautical engineering laboratories are located on the campus and at the University Airport. These facilities include an aerodynamics laboratory equipped with wind tunnels and visual flow apparatus, an aircraft physical testing laboratory with equipment for static and dynamic testing of aircraft parts and assemblies, and an aircraft power plants laboratory in which facilities are provided for instruction and research on reciprocating and jet engines and rocket motors. Laboratories for work with aircraft instruments, aircraft hydraulic and electrical systems, and general accessories are also available.

**Agricultural Engineering.** The curriculum in agricultural engineering includes the same basic courses as other engineering curricula, in addition to fundamental agricultural courses. In the junior year the student chooses one of two options: (1) the machinery and power option, which includes mechanical engineering design courses and advanced work in farm power and farm machinery design, and (2) the farm structures, soil and water engineering option, which includes civil engineering design and agricultural engineering courses in farm structures and soil and water engineering. By combining College of Agriculture requirements in a five-year program, the student may obtain bachelor's degrees, both in engineering and agriculture. For this five-year program he should first register in the College of Agriculture.

**Ceramic Engineering.** The courses in the Department of Ceramic Engineering deal with the general scientific principles underlying a wide variety of industries in which the raw materials are largely non-metallic minerals, generally silicates. The ceramic industries include the manufacture of brick, tile, and other structural clay products; pottery articles of all types; fire brick and other refractories; glass; porcelain enamels; abrasives; cements; and other products.

Training in ceramic engineering prepares men for positions of responsibility in the investigation of the physical and chemical properties of raw materials and ceramic products; in the technical control and supervision of processing and manufacturing operations; in the design and erection of kilns, dryers, and other plant equipment; in research and development of new processes and products; and in engineering service in connection with the sale and uses of ceramic materials, products, and processing equipment. Some opportunity for specialization in a particular field of ceramics is provided in elective courses in the curriculum.

The Ceramics Building provides well-equipped laboratories for student instruction and for research, classrooms, offices, library, and museum displays. The adjoining Kiln

Laboratory is equipped with a variety of kilns and furnaces for ceramic firing operations as well as machinery for the grinding of materials and for the production of structural clay products.

**Chemical Engineering.** The courses in chemical engineering, which are conducted by the Department of Chemistry in the College of Liberal Arts and Sciences, prepare students to evaluate results obtained in the laboratory and to translate them into large-scale commercial processes; to improve existing plants; to develop new commercial products; to design new equipment; and to operate and supervise plants in which chemical processes take place. The curriculum offers a thorough training in the fundamental sciences of chemistry, mathematics, and physics, and their application to industry.

The chemical engineering laboratories are in the East Chemistry Building and in several smaller buildings constructed for special investigations. The equipment in these laboratories is extensive, and in addition other equipment of the Department of Chemistry is available for the use of students in the curriculum in chemical engineering.

**Civil Engineering.** The curriculum in civil engineering offers a systematic training in the principles underlying the design and construction of bridges, buildings, dams, retaining walls, foundations, and other structures; highways; water supply and sewage disposal systems; hydraulic engineering works, etc. Opportunity is offered in the fourth year for a certain amount of specialization in some of the more important branches of civil engineering by the construction, highway, hydraulic, railway, and structural options.

Civil Engineering Hall provides ample space for the departmental offices, classrooms and the senior and junior drafting rooms. An individual desk, available at all times, is provided for each student. In the corridors of this building there is an exhibit of large pictures illustrating outstanding civil engineering works.

The Surveying Building contains recitation and drafting rooms and instrument lockers. It is located close to the surveying practice fields.

The Arthur Newell Talbot Laboratory houses laboratories of the Departments of Civil Engineering and Theoretical and Applied Mechanics. The concrete laboratory is provided with the facilities necessary for the study of the proportioning and mixing of concrete and of its physical properties. The highway laboratories are equipped for tests on bituminous and non-bituminous highway materials. The structural laboratory has testing machines varying in capacity from thirty thousand pounds to three million pounds and all of the necessary instruments for making a complete study of the behavior of structural materials under stress. The subgrade soils laboratory has apparatus for making the routine physical tests as outlined by the United States Bureau of Public Roads. In all of these laboratories provision is made for research and graduate work as well for undergraduate work.

The Sanitary Engineering Laboratory is equipped to conduct tests in the field of sanitary engineering, including water supply, distribution, and purification; sewerage and sewage treatment; and stream pollution. The University Water Works, the local works of the Illinois Water Service Company, and the sewage treatment works of the Urbana Champaign Sanitary District provide opportunities for practice and study.

The Hydraulic Engineering Laboratory is equipped to carry on model research projects in drainage, open channel flow, pressure flow, orifice discharge, spillway discharge, and other features pertaining to the design and construction of hydraulic structures. A unique feature of the laboratory is a heated space 10 feet wide and 330 feet long equipped with a traveling crane for the handling of heavy equipment. This space is well adapted to studies relating to either open channel or pipe flow.

**Electrical Engineering.** The electrical engineering curriculum prepares men for responsible engineering positions in research, development, design, operation, sales, and administration in the fields of electrical power, communication and electronic engineering, and illumination.

Fundamental to the curriculum is basic work in mathematics and physics which is taken by the student during his first two and one-half years. Work in the Electrical Engineering Department begins in the second semester of the second year with a basic course in electric circuits and fields. This course must be satisfactorily completed before any of the third year work in the department may be undertaken.

During the third year the student is expected to choose which of the three sub areas of the general electrical field he desires to emphasize. These three sub-areas are represented by the options in electrical power engineering, communication and electronic engineering, and illumination engineering. In each option technical courses and

aboratory exercises are combined to provide a broad general training as well as to emphasize the fields of the options.

The Electrical Engineering Building has laboratories which are well equipped for he experimental solution of problems in all fields of electrical engineering. Provision is also made for graduate work in these laboratories. Facilities are available for research in nost areas of electrical engineering including vacuum and gas tubes, antennas and fields, ultrasonics, power generation, and power transmission and distribution.

The Electrical Engineering Annex contains a laboratory for the study of high-voltage phenomena, the illumination laboratory, and the photometric laboratory. The llumination and photometric laboratories contain exceptionally complete equipment for he demonstration of illumination principles. A part of this laboratory contains complete equipment for colorimetry, making these laboratories outstanding in this field.

For students who show exceptional ability and interest and who present an integrated program of study, opportunities to do individual work, particularly of an investigational nature, are provided in both the third and fourth years. Although the options pecify the requirements for a degree, these students may pursue a program, if approved, fitted to their particular needs.

**General Engineering.** The curriculum in general engineering is provided for those tudents who wish to combine a sound education in engineering principles and their pplication with substantial basic work in industrial organization and administration, upplemented by cultural and humanistic studies in selected areas. Optional arrangeuents in design and other sequences are shown in the curriculum statements on page 117.

**Mechanical Engineering.** The courses in the Department of Mechanical Engineering present the theory and practice of the generation, transmission, and utilization of power; nd of the theory of operation, design, testing, and construction of machines of all kinds. n the laboratories emphasis is given to the engineering and economic principles of machine operation, performance, and construction, and to the problems of production nanagement.

The first year of the curriculum in mechanical engineering is the same as in other branches of engineering. The second year is common to all optional curricula in mechanical engineering. During the third and fourth years a wide variety of optional course equences is available which permits some emphasis in one of the following phases of he general field: heat power, machine design, production, research, air conditioning and efrigeration, petroleum production, and railway motive power. In addition to these pecial options there is a general option which permits the selection of electives cutting cross several of the special options. The student may select courses in general educaion, the social sciences, literature, and the humanities to the extent of twenty-four emester hours within the framework of the general option. All optional curricula conain the same strong basic courses in science, mathematics, mechanics, and engineering undamentals extending throughout the four years. Emphasis is on fundamentals even in he application subjects.

The laboratories of the department are provided with modern equipment for raduate investigations and research as well as undergraduate instruction. Detailed decription of the laboratory facilities is not possible in the space allotment here. However, brief listing of the laboratories will indicate the breadth of the available facilities. The following laboratories are located in the Mechanical Engineering Building, the Mechanical Engineering Laboratory Building, and in the Foundry Building: power, physical environment, internal combustion engine and turbine, machine tool, metal utting, welding, foundry, sand testing, heat treatment of metals, machine design, notion and time study, instrumentation and controls, heat transfer and combustion, hermodynamics, fuels and lubricants, gage calibration, and pattern. In addition, three esearch residences are owned, maintained, and operated by cooperating organizations or research in the general field of heating and ventilating. Several of these laboratories ontain special machines and equipment which make them outstanding in their respecve fields.

**Mining and Metallurgical Engineering.** The Department of Mining and Metallurgical Engineering offers two curricula, as follows:

**Metallurgical Engineering.** Metallurgy may be divided into three main divisions—hemical, mechanical, and physical. Chemical metallurgy includes the metallurgical rocesses involving chemical change and embraces methods of production and refining f metals from their ores. Mechanical metallurgy includes all the processes of working

and shaping metals and alloys—processes which do not involve chemical changes but adapt metals as to size and form, such as rolling, forging, drawing, spinning, casting, etc. Physical metallurgy deals with the nature, structure, physical, and mechanical properties of metals and alloys. It includes metallography, testing of metals and alloys, heat treatment of metals and alloys and the physical changes produced thereby. The curriculum in metallurgical engineering has been designed to include the engineering fundamentals of these three main divisions, but emphasis is placed upon physical metallurgy. Specialized courses are provided for ferrous and nonferrous process metallurgy, physical metallurgy, ferrous and nonferrous metallography, physics of metals, electrometallurgy, heat treatment, fuels and furnaces, alloy steels, and mechanical metallurgy.

**Mining Engineering.** The curriculum in mining engineering is designed for student instruction in the fundamental engineering problems dealing with the extraction of coal and minerals from the earth, and the preliminary preparation of these substances for use in our modern civilization. To the preliminary courses in mathematics, physics, chemistry, general engineering drawing, and mechanics, common to all curricula in engineering, the department adds specialized courses in mine surveying, mining methods, prospecting, mine examination, mine ventilation, coal preparation, mineral dressing, mine administration, and design of mine plants. Interwoven with the departmental program is a series of required courses which provides a broad engineering background for the student.

**Physics.** The Department of Physics offers a curriculum in engineering physics, designed to give students the broad and thorough training in fundamental physics and mathematics which is demanded by the increasing complexity of modern engineering practice. The work of the first two years is much like that in the other engineering curricula; in the last two years advanced courses in physics, mathematics, and chemistry are emphasized, but there is a liberal allowance of electives which the student may use to study the field of engineering in which he is especially interested. The details of technical applications are left to be learned in connection with a particular job; or, if the electives are properly selected, the engineering physics curriculum may be made a basis for graduate work in some particular field of engineering or in physics.

The Physics Laboratory has complete facilities for instruction and investigation in physics, and is especially well equipped for investigations in spectroscopy, high vacua, acoustics, magnetism, magnetic and electrical measurements, electronics, optics, and nuclear physics. Gas, direct and alternating current at several voltages, distilled water, compressed air, and liquid air are available. There are two well-equipped workshops, one for the mechanicians of the department and one for instructors and advanced students. Nearly all research equipment of a specialized nature is constructed here. A glass blower is in charge of a glass-blowing shop where a large variety of glass equipment is made. An excellent library of periodicals and books of special use in connection with the courses in physics is maintained in the Physics Laboratory.

A large cyclotron which yields 12 M.V.E. deuterons is housed in the Nuclear Radiations Laboratory and, with other experimental apparatus available there, is used by graduate students and faculty for experimental work in nuclear physics.

The betatron research and development program is housed in the Physics Research Laboratory. Faculty and graduate students are engaged in the study of nuclear phenomena produced by X-rays and electrons from the unique 340 M.E.V. betatron and the smaller 80 M.E.V. and 22 M.E.V. betatrons.

The laboratory for the physics of solids has a cryostat for the production of liquid helium and a variety of apparatus for the study of metals, semiconductors, and other solids.

**Railway Engineering.** To prepare students for service in the technical departments of railways, options are offered in railway civil engineering and railway mechanical engineering, both of which are substantially the same as the civil and mechanical engineering curricula up to the end of the third year. The option in railway civil engineering is prepared for those who plan to enter the engineering department of steam and electric railways, while the option in railway mechanical engineering is designed for those who wish to enter the motive-power department of steam railways. The special subjects in railway civil engineering concern the location, design, construction, and maintenance of track and equipment, and the design of railway structures. The courses in railway mechanical engineering add to the fundamentals of the general mechanical engineering curriculum special courses on the design of locomotives and cars, the resistance of trains, the performance and tests of locomotives, and tests of railway equipment. The University

wns and operates, jointly with the Illinois Central Railroad, a railway test car designed or experimental work on steam roads. It is equipped for making train resistance and locomotive performance tests.

**Sanitary Engineering.** The curriculum in sanitary engineering parallels closely that n civil engineering, putting greater emphasis on the engineering problems involved in he control of the environment to protect and improve health and comfort. The curricu- um is administered by the Department of Civil Engineering and leads to the degree of Bachelor of Science in Sanitary Engineering.

**Theoretical and Applied Mechanics.** The Department of Theoretical and Applied Mechanics offers courses in the mechanics of rigid and deformable bodies and of in- compressible fluids. Nearly all of the undergraduate curricula in engineering require courses in statics and dynamics of rigid bodies, in strength of elastic and of inelastic materials, and in hydraulics and fluid mechanics. In addition, the department offers graduate programs of study and research leading to the degrees of Master of Science and Doctor of Philosophy, in which basic theoretical physical laws, mathematics, and experi- nental investigations are emphasized.

The laboratories of the Department of Theoretical and Applied Mechanics, except he car wheel laboratory are housed in the Arthur Newell Talbot Laboratory, which also contains some of the laboratories of the Civil Engineering Department. An indication of he types of work conducted in the various laboratories is given as follows:

In the materials laboratory the student makes use of various types of testing machines or determining the load-resisting properties of materials required in the design, construc- ion, and operation of engineering machines and structures and for observing the strain behavior of members subjected to various types of loads. For research and advanced in- struction in the behavior of large machine parts and structural members, testing ma- hines with capacities as large as 600,000 and 3,000,000 pounds are available together with a wide selection of precise mechanical and electrical instruments for observing the letailed strain behavior of the member.

The concrete research laboratory has facilities for making, curing, and testing con- crete and reinforced concrete members under repeated and impact loading as well as static loading.

The fatigue of metals laboratory contains many machines of various types for the study of the behavior of materials under repeated loading and under particular en- vironmental conditions involving corrosion, high and low temperatures, etc. Facilities for he study of the creep and relaxation of materials are also available as a part of the general study of the effect of time and temperature on the behavior of materials with special reference to fatigue and elevated temperature service. This study involves the use of a knowledge of the internal crystalline structure of metals.

The photoelasticity laboratory is equipped for the analysis of stresses in bodies of irregular or complicated form for which mathematical methods of analysis of stresses are inadequate. Instrumentation is available for other methods of experimental stress analysis involving optical and electrical as well as mechanical methods. The vibration laboratory employs various models and instruments such as vibration excitors, oscillo- graphs, etc., for the study and analysis of vibrations in machine parts and structural mem- bers. The plastics laboratory, in which constant temperature and humidity are maintained, is equipped with a wide range of modern apparatus for the study of the load-resisting properties of plastics and plastic laminates.

The railroad rail and car wheel laboratories, the latter housed in a separate building, are available for carrying on research and advanced instruction on a number of problems involved in railway engineering.

The hydraulics and fluid mechanics laboratory contains equipment for the study of he flow of water in open channels, in pumps and turbines, and in various pipe systems. The flow of air and oil are also studied in several experiments. Some of the more impor- tant special equipment consists of several types of viscometers, transparent walled tilting flumes and a two-dimensional water tunnel. Facilities for research and graduate study are available in both open channel flow and closed conduit flow in maximum quantities of approximately 40 cu. ft./sec.

### ELECTIVES AND OPTIONS

Nontechnical electives for students in the College of Engineering include all courses offered in the College of Liberal Arts and Sciences and in the College of Commerce and Business Administration; the general courses in the College of Education; courses numbered 100 through 122 in the School of Music; Art 111, 112, and 115; L.A. 111; and the seven courses in Engineering numbered 140, 141, 216, 220, 230, 239, and 292. Field survey courses may be used in place of the nontechnical and approved electives in any curriculum, with some reduction in credit. Students electing the third and fourth years of military training and those taking naval science courses may count the credit they receive in place of approved and nontechnical electives to an amount equal to the total of these electives stated in each curriculum.

Technical electives include all courses in the College of Engineering not required in the student's curriculum, excepting G.E.D. 101, 102, 104, 106, 107, and 108, and Eng 140, 141, 216, 220, 230, 239, and 292.

Approved electives include all technical and nontechnical electives as defined above and other courses designated as approved electives in the outlines of curricula.

Departmental electives and technical options are restricted to courses of a technical character as listed under this classification by each department.

Options are groups of related courses in a special field of subject matter.

## Common Program for Freshmen (effective September 1, 1953)

Beginning September 1, 1953, the entrance requirements to the College of Engineering in mathematics will be increased to four units—algebra, 2 units; plane geometry 1 unit; solid geometry, ½ unit; and trigonometry, ½ unit. Students will continue to be admitted on the basis of a minimum of one unit each in algebra and plane geometry but they will be required to make up the deficiencies during their first year in college. This will necessarily delay their graduation one semester unless steps are taken early to offset the deficiencies. It is recommended that such students attend a summer session preceding entrance into college or immediately following their first year, thus eliminating the extra semester at the end.

The new freshman program, effective September 1, 1953, is shown below. The sophomore requirements in mathematics and physics common to all curricula of the college following the first year of the new program are also shown. The new curricula in their final form for the entire four-year period will be published in the 1952 edition of Careers in Engineering. A copy of this publication may be secured from the College of Engineering office at Urbana, Illinois, or at the Undergraduate Division in Chicago after June 1, 1952.

| FIRST YEAR FIRST SEMESTER | 18 OR 19 HOURS |
|---|---|
| Chem. 102 or 103—General Chemistry | 3 or 4 |
| Eng. 100—Engineering Lectures | 0 |
| G.E.D. 101—Elements of Drawing | 3 |
| Hygiene 101—Health Lectures | 2 |
| Math. 123—Analytic Geometry | 5 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 19 HOUR |
|---|---|
| Chem. 104—Chemistry of Metallic Elements | |
| G.E.D. 102—Descriptive Geometry | |
| Math. 133—Calculus | |
| Physics 106—Mechanics | |
| Rhet. 102—Rhetoric and Composition | |
| Physical Education | |
| Military (men) | |

Common core in all curricula.

| SECOND YEAR FIRST SEMESTER | |
|---|---|
| Math. 143—Calculus | 5 |
| Physics 107—Electricity and Magnetism, Modern Physics | 4 |

| SECOND SEMESTER | |
|---|---|
| Physics 108—Heat, Sound, Light | |

## Common Programs for Freshmen

Freshmen in the College of Engineering take this program unless otherwise specified in the curricula outlined on the following pages.

| FIRST YEAR FIRST SEMESTER | 17 OR 18 HOURS |
|---|---|
| Chem. 102 or 103—General Chemistry | 3 or 4 |
| Eng. 100—Engineering Lectures | 0 |
| G.E.D. 101—Elements of Drawing, or G.E.D. 104—Advanced Drawing | 4 |
| Math. 112—College Algebra | 3 |
| Math. 114 or 115—Plane or Advanced Trigonometry | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 19 HOURS |
|---|---|
| Chem. 104—Chemistry of the Metallic Elements | 4 |
| G.E.D. 102—Descriptive Geometry | 4 |
| Hygiene 101—Health Lectures | 2 |
| Math. 122—Analytic Geometry | 4 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

## N.R.O.T.C. Students in Engineering

| FIRST YEAR FIRST SEMESTER | 16 HOURS |
|---|---|
| Eng. 100—Engineering Lectures | 0 |
| G.E.D. 101—Elements of Drawing, or G.E.D. 104—Advanced Drawing | 4 |
| Math. 112—College Algebra | 3 |
| Math. 114 or 115—Plane or Advanced Trigonometry | 2 |
| N.S. 100—Ordnance and Communication | 0 |
| N.S. 111—Naval Orientation | 3 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |

| SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|
| Chem. 102 or 103—General Chemistry | 3 or 4 |
| Hygiene 101—Health Lectures | 2 |
| Math. 122—Analytic Geometry | 4 |
| N.S. 100—Ordnance and Communication | 0 |
| N.S. 112—History of Sea Power | 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |

It takes nine semesters to complete the requirements for a Bachelor of Science degree in any curriculum of the college in the N.R.O.T.C. program. The first two semesters are common to all curricula as stated above. The other seven are completely worked out and are on file in the college office and in each department offering a curriculum in the program.

## Curriculum in Aeronautical Engineering

For the Degree of Bachelor of Science in Aeronautical Engineering

FIRST YEAR

Common Program for Freshmen (see above)

| SECOND YEAR FIRST SEMESTER | 18 HOURS |
|---|---|
| G.E.D. 103—Aircraft Drafting and Lofting | 3 |
| Math. 132—Calculus | 5 |
| M.E. 182—Manufacturing Processes | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| Math. 142—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 156—Analytical Mechanics (Statics and Dynamics) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Nontechnical Electives[1] | 3 |

[1] Speech 101 or Eng. 216 recommended.

| THIRD YEAR | 19 HOURS |
|---|---|
| Aero. E. 201—Aircraft Materials and Processes | 3 |
| Aero. E. 211—Aerodynamics | 3 |
| Math. 345—Differential Equations and Orthogonal Functions[1] | 3 |
| M.E. 205—Thermodynamics | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |
| Nontechnical Electives[2] | 3 |

| | 18 HOURS |
|---|---|
| Aero. E. 212—Introduction to Aerodynamics of Real Fluids | 3 |
| Aero. E. 220—Aircraft Structures | 3 |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 |
| M.E. 222—Mechanics of Machinery | 3 |
| Approved Electives | 6 |

| FOURTH YEAR | 17 HOURS |
|---|---|
| Aero. E. 221—Aircraft Structures | 3 |
| Aero. E. 231—Aircraft Power Plants | 3 |
| Aero. E. 241—Airplane Design | 3 |
| Aero. E. 261—Aerodynamics Laboratory | 2 |
| Aero. E. 299—Inspection Trip[3] | 0 |
| E.E. 217—Electrical Measurement | 3 |
| Approved Electives | 3 |

| | 17 HOURS |
|---|---|
| Aero. E. 242—Airplane Design | 3 |
| Aero. E. 262—Aircraft Engine Laboratory | 2 |
| Aero. E. 264—Aircraft Structures Laboratory | 2 |
| Aero. E. 290—Seminar | 1 |
| Eng. 292—Engineering Law | 3 |
| Approved Electives | 6 |

## Curriculum in Agricultural Engineering

For the Degree of Bachelor of Science in Agricultural Engineering

FIRST YEAR

Common Program for Freshmen (page 109)

| SECOND YEAR FIRST SEMESTER | 19 HOURS |
|---|---|
| Agr. Eng. 111—Farm Structures and Soil and Water Conservation | 3 |
| Bot. 100—General Botany | 4 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 19 HOURS |
|---|---|
| Agr. Eng. 112—Tractors and Field Machinery | 3 |
| Agron. 121—Crop Production | 4 |
| Math. 142—Calculus | 5 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

### Third-Year Options

#### MACHINERY AND POWER OPTION

| | 18 HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Geol. 105—Agricultural Geology | 3 |
| M.E. 221—Mechanics of Machinery | 5 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 17 HOUR |
|---|---|
| Agr. Econ. 220—Farm Management | 3 |
| Agron. 201—Soils | 4 |
| M.E. 183—Materials Casting | 2 |
| M.E. 202—Thermodynamics | 3 |
| M.E. 224—Design of Machine Elements | 3 |

[1] Math. 341 may be substituted.

[2] Econ. 108 recommended.

[3] Not required during 1952-1953.

### FARM STRUCTURES, SOIL AND WATER ENGINEERING OPTION

| | 18 HOURS | | 19 HOURS |
|---|---|---|---|
| C.E. 115—General Surveying | 3 | Agr. Econ. 220—Farm Management | 3 |
| C.E. 235—Plain Concrete | 2 | Agr. Eng. 262—Farmstead and Home Equipment | 3 |
| Econ. 108—Elements of Economics | 3 | Agron. 201—Soils | 5 |
| Geol. 105—Agricultural Geology | 3 | C.E. 261—Structural Analysis | 4 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 | T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 221—Resistance of Materials | 3 | T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 | | |

## Fourth-Year Options

### MACHINERY AND POWER OPTION

| | 17 HOURS | | 17 HOURS |
|---|---|---|---|
| Agr. Eng. 299—Inspection Trip | 0 | Agr. Eng. 332—Design of Agricultural Machinery | 3 |
| Agr. Eng. 341—Farm Power | 3 | Agr. Eng. 393—Special Problems | 3 |
| E.E. 206—Direct and Alternating Current Circuits | 3 | E.E. 208—Direct and Alternating Current Apparatus | 3 |
| E.E. 207—Direct and Alternating Current Laboratory | 1 | E.E. 209—Direct and Alternating Current Laboratory | 1 |
| M.E. 184—Metal Processing | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| M.E. 271—Design of Machine Elements | 3 | Approved Electives | 4 |
| Approved Electives | 4 | | |

### FARM STRUCTURES, SOIL AND WATER ENGINEERING OPTION

| | 17 HOURS | | 15 HOURS |
|---|---|---|---|
| Agr. Eng. 351—Hydraulics of Soil and Water Conservation | 3 | Agr. Eng. 393—Special Problems | 3 |
| Agr. Eng. 299—Inspection Trip | 0 | C.E. 264—Structural Design | 5 |
| Agr. Eng. 371—Advanced Farm Structures | 3 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 262—Structural Analysis | 3 | Approved Electives | 5 |
| C.E. 263—Elementary Structural Design | 2 | | |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 | | |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 | | |
| Approved Electives | 3 | | |

## Curriculum in Ceramic Engineering

For the Degree of Bachelor of Science in Ceramic Engineering

**FIRST YEAR**

Common Program for Freshmen (page 109), except that Chem. 105 and Math. 117 and 127 are substituted for Chem. 104 and Math. 112, 114, and 122.

| SECOND YEAR — FIRST SEMESTER | 18 HOURS |
|---|---|
| Cer. E. 101—Introduction to Ceramic Engineering | 3 |
| Chem. 123—Quantitative Analysis | 5 |
| Math. 137—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| Cer. E. 102—Ceramic Processes and Equipment | 3 |
| Geol. 130—Mineralogy for Engineers | 3 |
| Math. 147—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 18 HOURS |
|---|---|
| Cer. E. 201—Ceramic Technology | 5 |
| Cer. E. 203—Principles of Drying | 3 |
| Chem. 245—Elementary Physical Chemistry | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |
| Approved Electives | 3 |

| | 17 OR 18 HOURS |
|---|---|
| Cer. E. 202—Ceramic Technology | 5 |
| Cer. E. 204—Kilns, Furnaces, and Firing Operations | 3 |
| Cer. E. 221—Pyrometry | 2 |
| Technical Electives | 4 or 5 |
| Approved Electives | 3 |

| FOURTH YEAR | 18 HOURS |
|---|---|
| Cer. E. 211—Ceramic Bodies and Glazes | 5 |
| Cer. E. 271—Ceramic Engineering Design | 2 |
| Cer. E. 299—Inspection Trip | 0 |
| C.E. 260—Structural Engineering | 3 |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory | 1 |
| Technical Electives | 2 |
| Approved Electives | 3 |

| | 17 OR 16 HOURS |
|---|---|
| Cer. E. 218—Refractories | 3 |
| Cer. E. 272—Ceramic Engineering Design | 3 |
| E.E. 204—Application of Electrical Equipment | 2 |
| E.E. 205—Electrical Equipment Laboratory | 1 |
| Technical Electives | 5 or 4 |
| Approved Electives | 3 |

## Curriculum in Chemical Engineering

For the Degree of Bachelor of Science in Chemical Engineering

This curriculum is administered by the College of Liberal Arts and Sciences (see page 177).

## Curriculum in Civil Engineering

For the Degree of Bachelor of Science in Civil Engineering

FIRST YEAR

Common Program for Freshmen (page 109). C.E. 101, three hours, and C.E. 102, four hours are required courses which will be taught at the Summer Surveying Camp following the first year.

| SECOND YEAR — FIRST SEMESTER | 18 HOURS |
|---|---|
| C.E. 103—Route Surveying | 3 |
| C.E. 160—Building Construction and Materials | 3 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| Econ. 108—Elements of Economics, or Speech 101—Principles of Effective Speaking[1] | 3 |
| Geol. 150—Geology for Engineers[1] | 3 |
| Math. 142—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

NOTE: Transfer students who have completed two years of work and who have not had any surveying should take C.E. 111, 112, and 203. Special programs can be arranged for these students and others who have not had C.E. 160 or T.A.M. 150, so that they can graduate in two years in certain options, provided they present an equivalent amount of appropriate credit.

| THIRD YEAR | 18 HOURS |
|---|---|
| C.E. 230—Soils and Bituminous Materials | 2 |
| C.E. 235—Plain Concrete | 2 |
| C.E. 261—Structural Analysis | 4 |
| M.E. 201—Mechanical Power Equipment | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 17 HOURS |
|---|---|
| C.E. 220—Highway Engineering Fundamentals | 3 |
| C.E. 262—Structural Analysis | 3 |
| C.E. 263—Elementary Structural Design | 2 |
| E.E. 202—Direct and Alternating Current Circuits and Machines, or Approved Electives[2] | 2 |
| E.E. 203—Direct and Alternating Circuits and Machines Laboratory, or Approved Electives[2] | 1 |
| T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| Approved Electives[2] | 2 |

## Fourth-Year Options

### GENERAL OPTION

| | 14 HOURS |
|---|---|
| C.E. 240—Water Supply | 4 |
| C.E. 264—Structural Design | 5 |
| C.E. 290—Contracts and Specifications | 2 |
| C.E. 295—Professional Practice | 0 |
| C.E. 299—Inspection Trip | 0 |
| Technical Electives | 3 |

| | 15 HOURS |
|---|---|
| C.E. 241—Sewerage | 3 |
| C.E. 270—Foundations and Retaining Walls | 3 |
| C.E. 296—Professional Practice | 0 |
| Technical Electives | 5 |
| Approved Electives | 4 |

[1] Eight hours of credit in foreign language (French, German, or Spanish) may be substituted for Geol. 150 (3 hours), Econ. 108 or Speech 101 (3 hours), and approved electives (2 hours).

[2] Students expecting to obtain their degree in sanitary engineering should replace these with Chem. 122.

## CONSTRUCTION OPTION

| 14 HOURS | | 15 HOURS | |
|---|---|---|---|
| C.E. 237—Estimates and Costs | 2 | C.E. 239—Construction Planning and Management | 4 |
| C.E. 238—Construction Equipment and Methods | 3 | C.E. 270—Foundations and Retaining Walls | 3 |
| C.E. 248—Water Supply and Sewerage | 4 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 264—Structural Design | 5 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Eng. 230—Labor Relations | 3 |
| C.E. 299—Inspection Trip | 0 | Approved Electives | 3 |

## HIGHWAY OPTION

| 15 HOURS | | 14 HOURS | |
|---|---|---|---|
| C.E. 223—Traffic Engineering | 4 | C.E. 222—Highway Geometric and Structural Design | 4 |
| C.E. 231—Advanced Highway Materials | 2 | C.E. 264—Structural Design | 5 |
| C.E. 248—Water Supply and Sewerage | 4 | C.E. 296—Professional Practice | 0 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 332—Engineering Properties of Soils | 2 |
| C.E. 290—Contracts and Specifications | 2 | Approved Electives | 3 |
| C.E. 295—Professional Practice | 0 | | |
| C.E. 299—Inspection Trip | 0 | | |

## HYDRAULIC OPTION

| 14 HOURS | | 15 HOURS | |
|---|---|---|---|
| C.E. 250—Hydrology | 3 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 252—Water Resources, Planning and Development | 3 | C.E. 271—Earth and Masonry Structures | 2 |
| C.E. 264—Structural Design | 5 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | C.E. 351—Drainage and Flood Control | 3 |
| C.E. 299—Inspection Trip | 0 | C.E. 355—Water Power Engineering | 4 |

## RAILWAY OPTION

| 15 HOURS | | 14 HOURS | |
|---|---|---|---|
| C.E. 226—Railway Location and Operation | 3 | C.E. 225—Railway Construction and Maintenance | 3 |
| C.E. 227—Terminals | 2 | C.E. 229—Signals | 2 |
| C.E. 264—Structural Design | 5 | C.E. 332—Engineering Properties of Soils | 2 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 290—Contracts and Specifications | 2 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | Econ. 384—Economics of Transportation, or C.E. 238—Construction Equipment and Methods | 3 |
| C.E. 299—Inspection Trip | 0 | | |

## STRUCTURAL OPTION

| 14 HOURS | | 15 HOURS | |
|---|---|---|---|
| C.E. 264—Structural Design | 5 | C.E. 248—Water Supply and Sewerage | 4 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 265—Structural Design | 4 |
| C.E. 295—Professional Practice | 0 | C.E. 271—Earth and Masonry Structures | 2 |
| C.E. 299—Inspection Trip | 0 | C.E. 290—Contracts and Specifications | 2 |
| C.E. 361—Statically Indeterminate Structures | 3 | C.E. 296—Professional Practice | 0 |
| Approved Electives | 3 | C.E. 362—Statically Indeterminate Structures | 3 |

## Curriculum in Electrical Engineering

For the Degree of Bachelor of Science in Electrical Engineering

**FIRST YEAR**

Common Program for Freshmen (see page 109)

| SECOND YEAR — FIRST SEMESTER | 18 HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| E.E. 126—Electric Circuits and Fields | 4 |
| Math. 142—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 154—Analytical Mechanics (Statics and Dynamics) | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

## Third-Year Options

### POWER ENGINEERING AND COMMUNICATION ENGINEERING OPTIONS

| | 18 HOURS |
|---|---|
| Econ. 248—Personnel Administration[1] | 3 |
| E.E. 320—Circuit Analysis | 4 |
| E.E. 321—Circuit Laboratory | 1 |
| Math. 345—Differential Equations and Orthogonal Functions | 3 |
| M.E. 202—Thermodynamics | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 19 HOURS |
|---|---|
| E.E. 288—Economic Aspects of Engineering | 3 |
| E.E. 322—Circuit Analysis | 4 |
| E.E. 323—Circuit Laboratory | 1 |
| E.E. 334—Electrical Power Apparatus, and E.E. 335—Electrical Power Apparatus Laboratory,[2] or E.E. 351—Networks and Lines[3] | 4 |
| E.E. 341—Electronics | 4 |
| Nontechnical Electives[1, 4] | 3 |

### ILLUMINATION ENGINEERING OPTION

| | 18 HOURS |
|---|---|
| Econ. 248—Personnel Administration[1] | 3 |
| E.E. 320—Circuit Analysis | 4 |
| E.E. 321—Circuit Laboratory | 1 |
| Math. 345—Differential Equations and Orthogonal Functions | 3 |
| M.E. 202—Thermodynamics | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 19 HOURS |
|---|---|
| E.E. 260—Fundamentals of Illumination | 3 |
| E.E. 322—Circuit Analysis | 4 |
| E.E. 323—Circuit Laboratory | 1 |
| E.E. 341—Electronics | 4 |
| E.E. 361—Elements of Illuminating Engineering Design | 4 |
| Mktg. 272—Industrial Selling[5] | 3 |

[1] These courses will be waived for students in advanced military.

[2] E.E. 334 and 335 to be omitted by students in the communication engineering option.

[3] E.E. 351 to be omitted by students in the power engineering option.

[4] All electives to be chosen from lists approved by the head of the department.

[5] These courses will be waived for students in advanced military. Where additional hours are needed approved electives will be added.

## Fourth-Year Options

### POWER ENGINEERING OPTION

| | 18 HOURS | | 16 HOURS |
|---|---|---|---|
| E.E. 268—Fundamentals of Illumination Engineering | 2 | E.E. 292—Seminar | 1 |
| E.E. 290—Seminar | 0 | E.E. 338—Electrical Power Apparatus | 3 |
| E.E. 299—Inspection Trip | 0 | E.E. 339—Electrical Power Apparatus Laboratory | 1 |
| E.E. 336—Electrical Power Apparatus | 4 | M.E. 203—Power Plant Equipment | 3 |
| E.E. 337—Electrical Power Apparatus Laboratory | 2 | Technical Electives[1] | 5 |
| E.E. 347—Industrial Electronics | 4 | Nontechnical Electives[1, 2] | 3 |
| E.E. 378—Fundamentals of Power Transmission Engineering | 3 | | |
| Nontechnical Electives[1, 2] | 3 | | |

### COMMUNICATION ENGINEERING OPTION

| | 16 HOURS | | 18 HOURS |
|---|---|---|---|
| E.E. 290—Seminar | 0 | E.E. 292—Seminar | 1 |
| E.E. 299—Inspection Trip | 0 | E.E. 332—Electrical Machinery | 3 |
| E.E. 330—Electrical Machinery | 3 | E.E. 333—Electrical Machinery Laboratory | 1 |
| E.E. 331—Electrical Machinery Laboratory | 1 | E.E. 355—Fields and Waves | 4 |
| E.E. 349—Electron Tube Circuits | 5 | Technical Electives[1] | 3 |
| E.E. 353—Radio Circuits | 4 | Nontechnical Electives[1, 2] | 6 |
| Technical Electives[1] | 3 | | |

### ILLUMINATION ENGINEERING OPTION

| | 17 HOURS | | 17 HOURS |
|---|---|---|---|
| Arch. 141—Materials and Methods of Construction[2] | 2 | Arch. 142—Materials and Methods of Construction[2] | 2 |
| E.E. 299—Inspection Trip | 0 | E.E. 292—Seminar | 1 |
| E.E. 330—Electrical Machinery | 3 | E.E. 332—Electrical Machinery | 3 |
| E.E. 331—Electrical Machinery Laboratory | 1 | E.E. 333—Electrical Machinery Laboratory | 1 |
| E.E. 347—Industrial Electronics | 4 | E.E. 364—Illumination Design and Economics | 4 |
| E.E. 362—Principles of Illumination Engineering | 4 | E.E. 365—Illumination Design Laboratory | 1 |
| E.E. 363—Illumination and Photometry Laboratory | 1 | E.E. 366—Illumination Sources | 3 |
| Nontechnical Electives | 2 | Mktg. 373—Sales Management[2] | 2 |

## Curriculum in Engineering Physics

For the Degree of Bachelor of Science in Engineering Physics

The purpose of this curriculum is to prepare students for investigations in engineering problems calling for a knowledge of physics and mathematics or chemistry, for positions in certain industries which prefer men with a thorough education in basic science, and for graduate study in physics.

Students in the engineering physics curriculum, when registering for advanced

[1] All electives to be chosen from lists approved by the head of the department.

[2] These courses will be waived for students in advanced military. Where additional hours are needed approved electives will be added.

undergraduate courses in physics at any stage in that curriculum, must have a grade average of at least 3.5 in all subjects, exclusive of the basic courses in military training and physical education, and a combined grade average of at least 3.5 in all subjects in mathematics and physics taken prior to such registration. Transfer students must have a corresponding record in the institution from which they transfer, and must maintain such status at the University.

**FIRST YEAR**

Common Program for Freshmen (page 109), except that substitution of Chem. 106 for Chem. 104 is advised.

| SECOND YEAR[1] FIRST SEMESTER | 19 HOURS |
|---|---|
| German, or Approved Elective | 4 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Approved Electives | 3 |

| SECOND SEMESTER | 19 HOURS |
|---|---|
| German, or Approved Elective | 4 |
| Math. 142—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Approved Electives | 3 |

| THIRD YEAR[1] | 18 HOURS |
|---|---|
| E.E. 320—Circuit Analysis | 4 |
| E.E. 321—Circuit Laboratory | 1 |
| Math. 343—Advanced Calculus[2] | 3 |
| Physics 281—Intermediate Atomic Physics | 3 |
| Physics 321—Theoretical Mechanics | 3 |
| Physics 341—Electricity and Magnetism | 4 |

| | 17 HOURS |
|---|---|
| Math. 345—Differential Equations and Orthogonal Functions[2] | 3 |
| Physics 322—Theoretical Mechanics | 3 |
| Physics 342—Electricity and Magnetism | 4 |
| Physics 343—Vacuum Tube Circuits[3] | 4 |
| Physics 360—Heat, or M.E. 205—Thermodynamics | 3 |

| FOURTH YEAR[1] | 17 HOURS |
|---|---|
| Physics 344—Vacuum Tube Circuits,[3] or Technical Option[4] | 4 |
| Physics 371—Light | 4 |
| Technical Option[4] | 3 |
| Approved Electives | 6 |

| | 17 HOURS |
|---|---|
| Chem. 240—Elementary Physical Chemistry | 3 |
| Physics 372—Light | 2 |
| Physics 374—Light Laboratory | 2 |
| Technical Option[4] | 3 |
| Approved Electives | 7 |

## Curriculum in General Engineering

For the Degree of Bachelor of Science in General Engineering

This curriculum is intended for students who do not wish to pursue the more specialized engineering curricula, with their somewhat extended emphasis on test procedures

[1] The election of Chem. 110, 124, and 234 is advised. Students wishing to emphasize chemistry may substitute chemistry electives for E.E. 320 and 321. Students wishing to emphasize electrical engineering should elect E.E. 350 and 351, 352 and 353, and 354 and 355 in their fourth year. Students wishing to emphasize geophysics should elect most or all of their technical options in geology. Five hours must be approved nontechnical courses.

[2] Math. 341 and 342, or Math. 347 and 348 may be substituted for Math. 343 and 345.

[3] Students desiring to emphasize electrical engineering may elect, if they so desire, E.E. 342 and 343 and E.E. 344 and 345 instead of Physics 343 and 344. These students should register in E.E. 350 and 351 concurrently with E.E. 342 and 343, or Physics 343; E.E. 344 and 345, or Physics 344 may be taken concurrently with E.E. 352 and 353. This allows E.E. 354 and 355 to be taken the second semester of the fourth year.

[4] Technical options: Chem. 110, 124, 234, 241, 336, 337, 342, 343, 344, 397, 398; E.E. 330 and 331, 344 and 345, 350 and 351, 352 and 353, 354 and 355; Geol. 102, 150, 246; Math. 161, 317 and 318, 327 and 328, 347 and 348, 361, 385, 387, 388; M.E. 184, 371, 372; any courses in physics or astronomy; T.A.M. 211, 221, 223.

and design, but who wish to secure a sound education in engineering principles and their application. Fifteen hours of work in economics, engineering law, industrial relations, etc., are required, and eight to fourteen hours of free electives are allowed. The mechanical engineering design sequence of courses, namely, M.E. 221, 224, and 271, plus six hours of approved electives will be accepted in place of C.E. 261, 262, 263, 264, and Geol. 150 in the third and fourth years. A sales engineering option can be readily planned within the elective framework of the curriculum.

**FIRST YEAR**

Common Program for Freshmen (page 109)

| SECOND YEAR — FIRST SEMESTER | 18 HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Math. 132—Calculus | 5 |
| M.E. 183—Materials Casting, or C.E. 115—General Surveying | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| C.E. 115—General Surveying, or M.E. 183—Materials Casting | 3 |
| Math. 142—Calculus | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Speech 101—Principles of Effective Speaking | 3 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Accy. 201—Fundamentals of Accounting | 3 |
| E.E. 206—Direct and Alternating Current Circuits | 3 |
| E.E. 207—Direct and Alternating Current Laboratory | 1 |
| M.E. 184—Metal Processing | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 18 HOURS |
|---|---|
| C.E. 261—Structural Analysis | 4 |
| E.E. 208—Direct and Alternating Current Apparatus | 3 |
| E.E. 209—Direct and Alternating Current Laboratory | 1 |
| M.E. 202—Thermodynamics | 3 |
| T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 234—Laboratory in Fluid Mechanics | 1 |
| Approved Electives[1] | 3 |

| FOURTH YEAR | 18 HOURS |
|---|---|
| C.E. 262—Structural Analysis | 3 |
| C.E. 263—Elementary Structural Design | 2 |
| C.E. 299—Inspection Trip | 0 |
| Eng. 230—Labor Relations, or Eng. 239—Industrial Development and Supervision | 3 |
| M.E. 203—Power Plant Equipment | 3 |
| Met. E. 230—Engineering Metallurgy | 3 |
| Approved Electives | 4 |

| | 18 HOURS |
|---|---|
| C.E. 264—Structural Design | 5 |
| Econ. 257—Corporation Finance | 3 |
| Eng. 292—Engineering Law | 3 |
| M.E. 208—Mechanical Engineering Laboratory | 3 |
| Approved Electives | 4 |

## Curriculum in Mechanical Engineering

For the Degree of Bachelor of Science in Mechanical Engineering

**FIRST YEAR**

Common Program for Freshmen (page 109)

[1] Geol. 150 for those choosing the structural option.

| SECOND YEAR — FIRST SEMESTER | 17 HOURS | SECOND SEMESTER | 18 HOURS |
|---|---|---|---|
| Math. 132—Calculus | 5 | Math. 142—Calculus | 3 |
| M.E. 171—Mechanism | 2 | M.E. 184—Metal Processing, or M.E. 183—Materials Casting | 3 |
| M.E. 183—Materials Casting, or M.E. 184—Metal Processing | 3 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | T.A.M. 156—Analytical Mechanics (Statics and Dynamics) | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |

| THIRD YEAR | 19 HOURS | | 19 HOURS |
|---|---|---|---|
| E.E. 206—Direct and Alternating Current Circuits | 3 | E.E. 208—Direct and Alternating Current Apparatus | 3 |
| E.E. 207—Direct and Alternating Current Laboratory | 1 | M.E. 206—Thermodynamics | 3 |
| M.E. 205—Thermodynamics | 3 | M.E. 207—Power Plant Equipment | 3 |
| M.E. 223—Mechanics of Machinery | 3 | M.E. 208—Mechanical Engineering Laboratory | 3 |
| T.A.M. 221—Resistance of Materials | 3 | M.E. 224—Design of Machine Elements | 3 |
| Options | 6 | T.A.M. 223—Resistance of Materials Laboratory | 1 |
| | | Options | 3 |

| FOURTH YEAR | 18 HOURS | | 16 HOURS |
|---|---|---|---|
| M.E. 255—Mechanical Engineering Laboratory | 3 | M.E. 260—Heating, Ventilating, and Air Conditioning[1] | 3 |
| M.E. 271—Design of Machine Elements | 3 | M.E. 291—Mechanical Engineering Seminar | 1 |
| M.E. 299—Inspection Trip | 0 | Options | 12 |
| Options | 12 | | |

All mechanical engineering students take the same subjects the first two years. During the third and fourth years students take the courses specified above and select, with guidance from the department advisers, one of the following options. Departmental electives in these options must be courses numbered above M.E. 249. Approved electives in the senior year must be upper level courses (junior or senior grade).

## General Option

This option permits selection of the courses to meet the needs of students whose interests differ from those who choose special options.

| THIRD YEAR | | | |
|---|---|---|---|
| Approved Electives | 3 | Approved Electives | 3 |
| Nontechnical Electives | 3 | | |

| FOURTH YEAR | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | Departmental Electives | 3 |
| Departmental Electives | 3 | Approved Electives | 6 |
| Approved Electives | 3 | Nontechnical Electives | 3 |
| Nontechnical Electives | 3 | | |

[1] To be taken in the first semester of the air conditioning and refrigeration option in place of approved electives.

## Aeronautical Option

This option is designed for those mechanical engineering students who may be interested in the aircraft industry.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| Aero. E. 211—Aerodynamics | 3 | Aero. E. 220—Aircraft Structures | 3 |
| Math. 387—Introduction to Numerical Methods, or Math. 345—Differential Equations and Orthogonal Functions, or Math. 341—Differential Equations | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| Aero. E. 221—Aircraft Structures | 3 | Aero. E. 261—Aerodynamics Laboratory | 2 |
| M.E. 234—Heat Treatment of Metals | 3 | Aero. E. 264—Aircraft Structures Laboratory | 2 |
| M.E. 256—Internal Combustion Engines | 3 | M.E. 258—Combustion Engine and Turbine Laboratory | 3 |
| Nontechnical Electives | 3 | Departmental Electives | 3 |
| | | Nontechnical Electives | 2 |

## Air Conditioning and Refrigeration Option

This option provides for those interested in heating, ventilating, air conditioning, and refrigeration.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| T.A.M. 232—Fluid Mechanics | 3 | Approved Electives | 3 |
| Nontechnical Electives | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | M.E. 259—Refrigeration Engineering | 3 |
| M.E. 254—Heat Transfer | 3 | M.E. 261—Heating, Ventilating, and Air Conditioning Design | 3 |
| M.E. 260—Heating, Ventilating, and Air Conditioning | 3 | Approved Electives | 6 |
| Nontechnical Electives | 3 | Nontechnical Electives | 3 |

## Design Option

This option provides for specialization in mechanical engineering design.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| Approved Electives | 3 | Math. 345—Differential Equations and Orthogonal Functions, or Math 341—Differential Equations | 3 |
| Nontechnical Electives | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| M.E. 234—Heat Treatment of Metals | 3 | M.E. 272—Analytical Design of High-Speed Engines, or M.E. 282—Tool Engineering | 3 |
| T.A.M. 311—Mechanical Vibrations | 3 | M.E. 273—Machine Design | 3 |
| T.A.M. 321—Advanced Mechanics of Materials, or M.E. 284—Welding Engineering | 3 | T.A.M. 326—Experimental Stress Analysis | 3 |
| Nontechnical Electives | 3 | Nontechnical Electives | 3 |

## Petroleum Production Option

This option is designed for those students interested in the mechanical engineering aspects of petroleum production.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| Geol. 150—Geology for Engineers | 3 | Geol. 102—Historical Geology | 3 |
| T.A.M. 232—Fluid Mechanics | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| Geol. 246—Applied Petroleum Geology | 3 | C.E. 115—General Surveying | 3 |
| M.E. 234—Heat Treatment of Metals | 3 | Geol. 247—Applied Petroleum Geology | 3 |
| M.E. 371—Petroleum Production Engineering | 3 | M.E. 372—Petroleum Production Engineering | 3 |
| Nontechnical Electives | 3 | Nontechnical Electives | 3 |

## Power Option

This option is for those students whose interests lie in the field of steam and gas power.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| T.A.M. 232—Fluid Mechanics | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| Nontechnical Electives | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| M.E. 254—Heat Transfer | 3 | M.E. 257—Gas Turbines | 3 |
| M.E. 256—Internal Combustion Engines | 3 | M.E. 258—Combustion Engine and Turbine Laboratory | 3 |
| T.A.M. 311—Mechanical Vibrations | 3 | M.E. 274—Power Plant Design | 3 |
| Nontechnical Electives | 3 | Nontechnical Electives | 3 |

## Production Option

This option provides emphasis on the production engineering aspects of mechanical engineering to meet the needs of those students planning on a career in the manufacturing industry.

**THIRD YEAR**

| | | | |
|---|---|---|---|
| Econ. 108—Elements of Economics | 3 | M.E. 234—Heat Treatment of Metals | 3 |
| M.E. 232—Motion and Time Study | 3 | | |

**FOURTH YEAR**

| | | | |
|---|---|---|---|
| M.E. 231—Advanced Metal Processing | 3 | M.E. 282—Tool Engineering | 3 |
| M.E. 281—Manufacturing Organization and Operation | 3 | M.E. 283—Industrial Plant Design | 3 |
| M.E. 284—Welding Engineering | 3 | Approved Electives | 3 |
| Nontechnical Electives | 3 | Nontechnical Electives | 3 |

## Research Option

This option is intended for students interested in research and development.

THIRD YEAR

| | |
|---|---|
| Math. 387—Introduction to Numerical Methods, or Math. 345—Differential Equations and Orthogonal Functions, or Math. 341—Differential Equations | 3 |
| T.A.M. 232—Fluid Mechanics | 3 |
| M.E. 234—Heat Treatment of Metals | 3 |

FOURTH YEAR

| | |
|---|---|
| M.E. 254—Heat Transfer | 3 |
| M.E. 297—Experimental Investigations | 3 |
| Nontechnical Electives | 6 |
| M.E. 298—Thesis, or Approved Elective | 3 |
| T.A.M. 311—Mechanical Vibrations | 3 |
| T.A.M. 321—Advanced Mechanics of Materials, or E.E. 212—Electronics | 3 |
| Nontechnical Electives | 3 |

## Railway Option

This option permits specialization in railway mechanical engineering.

THIRD YEAR

| | |
|---|---|
| T.A.M. 232—Fluid Mechanics | 3 |
| Nontechnical Electives | 3 |
| M.E. 234—Heat Treatment of Metals | 3 |

FOURTH YEAR

| | |
|---|---|
| M.E. 231—Advanced Metal Processing | 3 |
| M.E. 256—Internal Combustion Engines | 3 |
| M.E. 361—Railway Motive Power Equipment | 3 |
| Nontechnical Electives | 3 |
| M.E. 259—Refrigeration Engineering | 3 |
| M.E. 274—Power Plant Design | 3 |
| M.E. 362—Railway Motive Power Operation | 3 |
| Nontechnical Electives | 3 |

## Curriculum in Mining Engineering

For the Degree of Bachelor of Science in Mining Engineering

FIRST YEAR

Common Program for Freshmen (page 109)

| SECOND YEAR FIRST SEMESTER 19 HOURS | |
|---|---|
| Geol. 150—Geology for Engineers | 3 |
| Math. 132—Calculus | 5 |
| Min. E. 151—Elements of Mining | 4 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER 18 HOUR | |
|---|---|
| Geol. 130—Mineralogy for Engineers | 3 |
| Math. 142—Calculus | 5 |
| Min. E. 152—Fuels | 4 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| HIRD YEAR | 17 HOURS |
|---|---|
| :.E. 115—General Surveying | 3 |
| :con. 108—Elements of Economics | 3 |
| :.E. 206—Direct and Alternating Current Circuits | 3 |
| :.E. 207—Direct and Alternating Current Laboratory | 1 |
| .A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| .A.M. 232—Fluid Mechanics | 3 |
| .A.M. 234—Laboratory in Fluid Mechanics | 1 |

| :UMMER | FIRST AND SECOND WEEKS |
|---|---|
| Iin. E. 205—Summer Mine Surveying | 2 |

| OURTH YEAR | 17 HOURS |
|---|---|
| Iin. E. 251—Mine Administration | 3 |
| Iin. E. 253—Principles of Mining Methods | 4 |
| Iin. E. 255—Mineral Dressing | 3 |
| Iin. E. 257—Haulage, Hoisting, and Pumping | 4 |
| Iin. E. 299—Inspection Trip | 0 |
| Iin. E. 351—Geophysics of Mining | 3 |

| | 19 HOURS |
|---|---|
| Econ. 240—Labor Problems, or Econ. 248—Personnel Administration | 3 |
| E.E. 208—Direct and Alternating Current Apparatus | 3 |
| E.E. 209—Direct and Alternating Current Laboratory | 1 |
| Geology Elective | 3 |
| M.E. 201—Steam, Air, and Gas Machinery | 3 |
| Min. E. 204—Mine Surveying | 2 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 15 HOURS |
|---|---|
| Met. E. 230—Engineering Metallurgy | 3 |
| Min. E. 256—Mine Examination and Valuation | 2 |
| Min. E. 258—Mining Design | 3 |
| Min. E. 260—Coal Preparation | 2 |
| Min. E. 262—Mine Ventilation | 3 |
| Min. E. 396—Seminar | 1 |
| Approved Elective | 1 |

## :urriculum in Metallurgical Engineering

For the Degree of Bachelor of Science in Metallurgical Engineering

This curriculum is intended for the training of industrial metallurgists and those vho wish to engage in advanced study and research either in operational processes or n various problems involving physical and chemical phases of metallurgy.

IRST YEAR

:ommon Program for Freshmen (page 109), except that Chem. 105 and G.E.D. 106 are substituted for Chem. 104 and G.E.D. 101.

| ECOND YEAR | FIRST SEMESTER | 17 HOURS |
|---|---|---|
| :hem. 123—Quantitative Analysis for Engineers | | 5 |
| Iath. 132—Calculus | | 5 |
| hysics 103—General Physics (Mechanics, Heat, and Sound) | | 5 |
| hysical Education | | 1 |
| Iilitary (men) | | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| Math. 142—Calculus | 3 |
| Met. E. 150—Introduction to Metallurgy | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Approved Electives | 3 |

| HIRD YEAR | 17 HOURS |
|---|---|
| er. E. 221—Pyrometry | 2 |
| hem. 245—Elementary Physical Chemistry | 3 |
| Iet. E. 201—Principles of Physical Metallurgy | 3 |
| Iet. E. 203—Physical Metallurgy Laboratory | 1 |
| Iet. E. 205—Metallurgy of Iron and Steel | 3 |
| Iet. E. 207—Metallurgical Calculations | 2 |
| pproved Electives | 3 |

| | 19 HOURS |
|---|---|
| Chem. 246—Elementary Physical Chemistry | 3 |
| Met. E. 208—Ferrous Metallography | 3 |
| Met. E. 210—Ferrous Metallography Laboratory | 3 |
| Met. E. 214—Electrometallurgy | 2 |
| Met. E. 216—Electrometallurgy Laboratory | 1 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |
| Approved Electives | 3 |

| FOURTH YEAR | 19 HOURS |
|---|---|
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 |
| E.E. 203—Direct and Alternating Current Circuits and Machines Laboratory | 1 |
| Met. E. 251—Nonferrous Metallography | 3 |
| Met. E. 253—Nonferrous Metallography Laboratory | 3 |
| Met. E. 255—Metallurgy of Nonferrous Metals | 3 |
| Met. E. 295—Metallurgical Seminar | 1 |
| Met. E. 299—Inspection Trip | 0 |
| T.A.M. 323—Advanced Laboratory in Materials Testing | 3 |
| Approved Electives | 3 |

| | 17 OR 18 HOURS |
|---|---|
| E.E. 204—Applications of Electrical Equipment | 2 |
| E.E. 205—Electrical Equipment Laboratory | 1 |
| Met. E. 256—Metallurgy of Deep Drawing and Pressing | 3 |
| Met. E. 258—Alloy Steels | 3 |
| Met. E. 260—Advanced Physical Metallurgy Laboratory | 3 |
| Met. E. 296—Metallurgical Seminar | 1 |
| Approved Electives | 4 or 5 |

## Curriculum in Sanitary Engineering[1]

For the Degree of Bachelor of Science in Sanitary Engineering

**FIRST YEAR**

Common Program for Freshmen (page 109). C.E. 101 (3 hours) and C.E. 102 (4 hours) are required courses which will be taught only at the summer surveying camp following the freshman year.

| SECOND YEAR FIRST SEMESTER | 18 HOURS |
|---|---|
| C.E. 103—Route Surveying | 3 |
| C.E. 160—Building Construction and Materials | 3 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| C.E. 140—Engineering in Public Health[2] | 3 |
| Geol. 150—Engineering Geology[3] | 3 |
| Math. 142—Calculus | 5 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

NOTE: Transfer students who have completed two years of work and who have not had any surveying should attend summer surveying camp before starting their third year; otherwise they will take C.E. 111, 112, and 203 on the campus.

| THIRD YEAR | 18 HOURS |
|---|---|
| C.E. 230—Soils and Bituminous Materials | 2 |
| C.E. 235—Plain Concrete | 2 |
| C.E. 261—Structural Analysis | 4 |
| Econ. 108—Elements of Economics, or Speech 101—Principles of Effective Speaking[3] | 3 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 17 HOURS |
|---|---|
| Chem. 122—Elementary Quantitative Analysis | 4 |
| C.E. 262—Structural Analysis | 3 |
| C.E. 263—Elementary Structural Design | 3 |
| M.E. 201—Mechanical Power Equipment | 3 |
| T.A.M. 232—Fluid Mechanics | 3 |
| T.A.M. 234—Laboratory in Fluid Mechanics | 1 |

[1] Administered by the Department of Civil Engineering.

[2] Students who have had C.E. 140 are excused from Bact. 104.

[3] Eight hours of credit in foreign language (French, German, or Spanish) may be substituted for Geol. 150 (3 hours), Econ. 108 or Speech 101 (3 hours), and approved electives (2 hours.)

Students who have completed three years in civil engineering can complete the sanitary engineering curriculum in one year, provided the substitution of Chem. 122 for the electives shown on page 113 is made in the sixth semester.

| FOURTH YEAR | 15 TO 20 HOURS | | 14 HOURS |
|---|---|---|---|
| Bact. 104- Introductory Bacteriology[1] | 5 | Chem. 132—Elementary Organic Chemistry | 3 |
| C.E. 220—Highway Engineering Fundamentals | 3 | C.E. 241—Sewerage | 3 |
| C.E. 240—Water Supply | 4 | C.E. 264—Structural Design | 5 |
| C.E. 270—Foundations and Retaining Walls | 3 | C.E. 296—Professional Practice | 0 |
| C.E. 295—Professional Practice | 0 | C.E. 345—Public Health Engineering | 3 |
| C.E. 299—Inspection Trip | 0 | | |
| C.E. 344—Water and Sewage Treatment | 5 | | |

[1] Students who have had C.E. 140 are excused from Bact 104.

Future architects at work.

# College of Fine and Applied Arts

Art, architecture, landscape architecture, and music are taught in the College of Fine and Applied Arts. The professional curricula in all these subjects admit freshmen. In each curriculum the students are required to take certain basic and cultural courses, and other subjects essential to a liberal education, and are permitted to elect additional courses according to individual interests.

For students enrolled in other colleges and schools of the University at Urbana, the College of Fine and Applied Arts offers introductory courses designed to increase esthetic appreciation and to portray the role of the arts in civilization, as well as courses in applied music.

## REQUIREMENTS FOR GRADUATION

Students who meet the general University requirements with reference to registration, residence, scholarship, fees, hygiene, military training, physical education, and rhetoric, and who maintain a satisfactory record, receive degrees appropriate to the curricula completed.

The curriculum in architecture, with two options, requires 165 semester hours for graduation. The degree of Bachelor of Architecture is awarded.

The curricula in painting, advertising, design, industrial design, and history of art require 130 semester hours for the degree. The degree of Bachelor of Fine Arts is awarded in the curriculum completed. A curriculum leading to the degree of Bachelor of Fine Arts in Art Education is offered for students preparing to teach art. Graduation requires 130 semester hours in addition to physical education and military training.

The curricula in landscape architecture and landscape operation require 130 semester hours for graduation. The degree of Bachelor of Fine Arts in Landscape Architecture is conferred on students completing the former curriculum, and the degree of Bachelor of Science in Landscape Operation is conferred on those completing the latter.

The curriculum in music, with instrumental, voice, or theory major, leads to the degree of Bachelor of Music. This curriculum requires 130 semester hours for graduation. The curriculum in music education leads to the degree of Bachelor of Science in Music Education and requires 130 semester hours in addition to physical education and military training.

## HONORS AT GRADUATION

The honors awarded to superior students at graduation are designated on the diploma as Honors, High Honors, and Highest Honors. To be considered for honors, a student must have been in residence at the University for at least four semesters, or must have earned in residence a minimum of sixty-five hours credit. For the degree with Honors, the student must have a scholastic average of 4.0; for the degree with High Honors, a scholastic average of 4.25 (for transfer students no more than six hours of "D" in transferred credit); for the degree with Highest Honors, a scholastic average of 4.50 (for transfer students no hours of "D" in transferred credit).

### SPECIAL REQUIREMENTS

**Foreign Language.** In curricula where a foreign language is required, a student who has completed one high school unit or more of a foreign language beyond the language entrance requirement may be excused from the curricular requirement to the extent that each high school unit is considered the equivalent of four semester hours of credit. Additional elective credit must be supplied for the credit requirement from which the student is excused.

**Inspection Trip.** Organized inspection trips are scheduled each semester in the curriculum in architecture, and each student is urged to participate in at least one trip each year. Students in certain art and landscape architecture classes also make trips to industrial and art centers.

### DEPARTMENTS AND CURRICULA

The College of Fine and Applied Arts consists of the Department of Architecture, the Department of Art, the Department of Landscape Architecture, the School of Music, the University Bands, and the Bureau of Community Planning. The undergraduate curricula, which are described in the following paragraphs, are outlined on subsequent pages.

All departments in the College of Fine and Applied Arts reserve the right to retain, exhibit, and reproduce the work submitted by students for credit in any course.

**Architecture.** Architecture is concerned with the design and construction of efficient, safe, economical, and attractive buildings to satisfy man's need for shelter. The building industry is one of the largest in the nation in terms of expenditure and employment. For leadership the industry depends upon the architectural profession to develop new building types, new materials, and new systems of construction. The well-trained architect who can bring to these problems a high degree of technical knowledge, social insight, creative imagination, and business skill will find opportunities for service as well as ample rewards for his talents and efforts.

The curriculum in architecture contains a well-balanced program of general and technical training. The graduate who has acquired the necessary practical experience can, therefore, apply for state professional registration to practice. Technical subjects stress both a sound comprehension of fundamental theory and the logical solution of realistic problems met in practice. General studies include a liberal proportion of courses in the physical and social sciences and the humanities which can give the graduate that appreciation and understanding of society so necessary in achieving a useful career and satisfying life.

The curriculum provides two options which allow the student to undertake advanced courses according to his special talents and interests. The general option offers advanced work in designing large buildings. The engineering option (formerly the separate curriculum in architectural engineering) emphasizes advanced courses in structural theory and design. Both options lead to the same degree, Bachelor of Architecture. Although students will normally make their choice of option at the beginning of the second year, the program is so arranged that the change may be made without difficulty at any time up to the middle of the fourth year. Graduate courses leading to a master's degree are offered under the regulations of the Graduate College.

The four-year curricula in architecture as published in the 1949-1950 Undergraduate Study bulletin will be in effect for students who entered college training prior to September, 1949.

The Department of Architecture occupies drafting rooms, studios, and offices in the Building for Architecture and Kindred Subjects. The Ricker Library in this building is one of the country's great collections in this field. It includes 26,159 volumes on architecture and the fine arts, 28,181 lantern slides, 22,503 mounted photographs and drawings, and 14,766 clippings. The department brings numerous outstanding architects to lecture on current professional topics and it conducts regular student field inspection trips to Chicago and other centers.

**Art.** The curricula in art permit a student to attain a proficiency in art and to secure a liberal education. The first year of the curricula is basic and cultural, and at the beginning of the second year the student chooses his field of specialization in one of the following options:

The curriculum in painting forms a preparation for the following fields of applied art and for related fields: portraiture, illustration, mural decoration, and general creative painting.

The curriculum in industrial design trains designers for machine industries. This option aims to give the student a firm grasp of the principles of design, to develop in him speed and resourcefulness in expression, and to train him to adapt his knowledge and creative abilities to the conditions under which the designer must work in industry.

The curriculum in advertising design trains artists in the application of esthetic principles in the fields of advertising, printing, merchandising, and salesmanship.

The curriculum in art education offers specialization in teaching methods, materials, and processes and conforms to the regulations set down by the office of the State Superintendent of Public Instruction. This curriculum, while particularly designed for those students who are primarily interested in the teaching of art, affords preparation in the fields of art supervision and applied design.

The curriculum in the history of art offers opportunities for those who are interested in art criticism and history.

The Department of Art has a series of well-equipped and ideally lighted studios and modeling rooms in the Building for Architecture and Kindred Subjects. Additional studios are also maintained in Lincoln Hall, David Kinley Hall, Civil Engineering Hall, the Surveying Building, the studio at 404 South Mathews Avenue, the east wing of the Illini Union Coffee House, and the Graduate Studio.

This department has well-selected collections of models, casts, bronzes, paintings, etchings, and prints, and adequate collections of lantern slides and photographs of famous works of art. Professional models are employed as subjects for the classes in drawing, painting, and modeling from life. Art students share in the use of the Ricker Library which includes the literature of art as well as of architecture.

Courses in the history and appreciation of art, drawing, sculpture, crafts, and design are open to students from other colleges of the University.

Graduate courses leading to the degrees of Master of Fine Arts in Art Education, in the History of Art, and in Painting are offered under the regulations of the Graduate College.

**Landscape Architecture.** The instructional work in landscape architecture consists of a four-year curriculum leading to the degree of Bachelor of Fine Arts in Landscape Architecture, and is designed to prepare the student for professional practice by providing a carefully balanced program of technical courses and of basic courses in the humanities. A four-year curriculum in landscape operation, leading to the degree of Bachelor of Science in Landscape Operation, is offered for students preparing to enter the contracting and maintenance branches of landscape architecture. Courses in the appreciation of landscape architecture and planning are offered for students in other colleges of the University.

Graduate courses leading to the degree of Master of Fine Arts in Landscape Architecture or Master of Science in City Planning are offered under the regulations of the Graduate College.

The Department of Landscape Architecture occupies quarters in Mumford Hall, where it has drafting rooms and an excellent library. The collections of trees, shrubs, and other plants growing on the campus and about residences in the community, as well as a fine herbarium, furnish materials for the study of plants and of planting design.

**Music.** The School of Music offers a curriculum in music, with three options leading to the degree of Bachelor of Music, and a curriculum in music education leading to the degree of Bachelor of Science in Music Education. A student enrolled in any music curriculum pursues throughout the four years of his course (except the third and fourth years of the curriculum in music education) a major or principal applied subject (piano, voice, etc.) in which two thirty-minute lessons a week are taken; and a minor or secondary applied subject in which one thirty-minute lesson a week is taken for three years. Public performance is a definite part of the training in applied music and all students, when sufficiently advanced, are required to participate in the student programs. As part of the requirements for the Bachelor of Music degree, senior students must present a satisfactory public recital.

Courses leading to the Bachelor of Arts degree with a major in music (thirty-two hours) in the College of Liberal Arts and Sciences are offered to qualified students. Prescribed courses in music leading to this degree are predominantly in the fields of theory and history. Applicants are expected to have a rudimentary knowledge of theory and to

possess a moderate degree of proficiency on the piano. (See General Curriculum in Liberal Arts and Sciences, page 166.)

Applied music and courses in the history, theory, and appreciation of music are open to all qualified students in the University.

Graduate courses leading to the degree of Master of Music and the degrees of Master of Science and Doctor of Education in Music Education are offered under the regulations of the Graduate College.

The University Orchestras (Sinfonietta, Symphony Orchestra) and the University Choral Union (Oratorio Society, University Chorus, Women's Glee Club, Men's Glee Club, University Choir) are open to qualified students from any college. The Oratorio Society, University Chorus, Opera Workshop, and Symphony Orchestra are also open to members of the faculty and staff and singers of the community who are admitted by examination or by permission of the respective directors. All of these organizations hold weekly rehearsals and give public presentations throughout the school year.

The faculty and students of the School of Music present concerts and recitals each week of the school year. The School of Music also sponsors weekly radio broadcasts over station WILL. Chamber music concerts are given frequently throughout the year by the Walden String Quartet whose members are artists-in-residence and members of the faculty of the School of Music.

The School of Music occupies the Tina Weedon Smith Memorial Hall and three annex buildings which have soundproof studios, lecture rooms, classrooms, extensive equipment of musical instruments, a library, and an auditorium designed for public recitals and concerts.

#### ELECTIVES

All electives in both options of the curriculum in architecture must be selected from courses in the humanities, social sciences, or biological sciences. Since these electives are intended to provide general education, no technical subjects will be approved. Students are urged to plan their electives in range and sequence so that in one or two areas they will be able to go beyond the introductory level.

Electives for other curricula may consist of any courses given in the University which are not required in the curriculum, do not parallel the subject matter of required courses, and are not open to freshmen. The following are exceptions: Bot. 100, 101; Geog. 101; Geol. 101; Hist. 111, 112, 131, 132; Lib. Sci. 195; Math. 111, 112, 114, 115, 117, 122; Zool. 101.

## Curriculum in Architecture

The first year is common to both options of the curriculum in architecture.

| FIRST YEAR | FIRST SEMESTER | 16 HOURS |
|---|---|---|
| Art 181—Freehand Drawing | | 2 |
| G.E.D. 107—Architectural Projections | | 2 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | | 2 |
| Math. 117—Combined Freshman Mathematics | | 5 |
| Rhet. 101—Rhetoric and Composition | | 3 |
| Physical Education | | 1 |
| Military (men) | | 1 |

| SECOND SEMESTER | 16 HOURS |
|---|---|
| Arch. 101—Introduction to Architecture | 3 |
| Art 182—Freehand Drawing | 2 |
| G.E.D. 108—Architectural Projections | 2 |
| Math. 127—Combined Freshman Mathematics | 4 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

## General Option

For the Degree of Bachelor of Architecture

**FIRST YEAR**

Program for Freshmen (page 130)

| SECOND YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Arch. 131—Architectural Design | 3 |
| Arch. 141—Materials and Methods of Construction I | 2 |
| Art 183—Freehand Drawing | 2 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Electives | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 HOURS |
|---|---|
| Arch. 113—History of Ancient Architecture | 2 |
| Arch. 132—Architectural Design | 3 |
| Arch. 142—Materials and Methods of Construction II | 2 |
| Art 184—Freehand Drawing | 2 |
| T.A.M. 171—Elements of Mechanics | 3 |
| Electives | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 16 HOURS |
|---|---|
| Arch. 133—Architectural Design | 3 |
| Arch. 143—Materials and Methods of Construction III | 2 |
| Arch. 214—History of Medieval Architecture | 3 |
| Art 281—Freehand Drawing | 2 |
| Sociol. 276—Sociology of the City | 3 |
| T.A.M. 172—Strength of Materials | 3 |

| | 18 HOURS |
|---|---|
| Arch. 134—Architectural Design | 3 |
| Arch. 144—Materials and Methods of Construction IV | 2 |
| Arch. 215—History of Renaissance and Baroque Architecture | 3 |
| Arch. 245—Structural Elements | 3 |
| Art 282—Freehand Drawing | 2 |
| Physics 102—General Physics (Mechanics, Heat, and Sound) | 5 |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Arch. 216—Modern Architecture | 3 |
| Arch. 235—Architectural Design | 5 |
| Arch. 246—Theory of Structural Design | 3 |
| Arch. 265—Theory of Architecture | 2 |
| Electives | 3 |

| | 17 HOURS |
|---|---|
| Arch. 236—Architectural Design | 5 |
| Arch. 256—Building Sanitation | 2 |
| Arch. 257—Reinforced Concrete Theory | 3 |
| L.A. 272—Planning of Towns and Cities | 3 |
| M.E. 252—Heating and Ventilating for Architectural Engineers | 4 |

| FIFTH YEAR | 16 HOURS |
|---|---|
| Arch. 244—Working Drawings | 2 |
| Arch. 247—Structural Planning | 3 |
| Arch. 337—Architectural Design | 7 |
| Art 150—Sculpture | 2 |
| Electives | 2 |

| | 16 HOURS |
|---|---|
| Arch. 283—Architectural Practice | 2 |
| Arch. 338—Architectural Design | 7 |
| E.E. 114—Wiring and Illumination | 3 |
| Electives | 4 |

## Engineering Option

For the Degree of Bachelor of Architecture

**FIRST YEAR**

Program for Freshmen (page 130)

| SECOND YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Arch. 131—Architectural Design | 3 |
| Arch. 141—Materials and Methods of Construction I | 2 |
| Art 183—Freehand Drawing | 2 |
| Math. 137—Calculus | 3 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 HOURS |
|---|---|
| Arch. 113—History of Ancient Architecture | 2 |
| Arch. 132—Architectural Design | 3 |
| Arch. 142—Materials and Methods of Construction II | 2 |
| Art 184—Freehand Drawing | 2 |
| Math. 147—Calculus | 3 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Arch. 133—Architectural Design | 3 |
| Arch. 143—Materials and Methods of Construction III | 2 |
| Arch. 214—History of Medieval Architecture | 3 |
| Art 281—Freehand Drawing | 2 |
| Sociol. 276—Sociology of the City | 3 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 18 HOUR |
|---|---|
| Arch. 134—Architectural Design | 3 |
| Arch. 144—Materials and Methods of Construction IV | 2 |
| Arch. 215—History of Renaissance and Baroque Architecture | 3 |
| Arch. 245—Structural Elements | 3 |
| Art 282—Freehand Drawing | 2 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Arch. 216—History of Modern Architecture | 3 |
| Arch. 235—Architectural Design | 5 |
| Arch. 246—Theory of Structural Design | 3 |
| Arch. 265—Theory of Architecture | 2 |
| Electives | 3 |

| | 17 HOUR |
|---|---|
| Arch. 236—Architectural Design | 5 |
| Arch. 256—Building Sanitation | 2 |
| Arch. 257—Reinforced Concrete Theory | 3 |
| M.E. 252—Heating and Ventilating for Architectural Engineers | 3 |
| Electives | 4 |

| FIFTH YEAR | 16 HOURS |
|---|---|
| Arch. 244—Working Drawings | 2 |
| Arch. 247—Structural Planning | 3 |
| Arch. 347—Theory of Structures | 5 |
| T.A.M. 211—Analytical Mechanics (Dynamics) | 3 |
| Electives | 3 |

| | 16 HOUR |
|---|---|
| Arch. 283—Architectural Practice | 2 |
| Arch. 348—Advanced Structures | 5 |
| Arch. 358—Reinforced Concrete Design | 3 |
| E.E. 114—Wiring and Illumination | 2 |
| Electives | 4 |

## Curricula in Art

The first year is common to all curricula in art.

| FIRST YEAR — FIRST SEMESTER | 17 TO 19 HOURS |
|---|---|
| Arch. 171—Drawing Theory | 2 |
| Art 117—Drawing | 3 |
| Art 119—Design | 2 |
| D.G.S. 111—Verbal Communication, or Rhet. 101—Rhetoric and Composition | 4 or 3 |
| D.G.S. 131—Biological Science, or Foreign Language | 4 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 15 TO 17 HOUR |
|---|---|
| Arch. 172—Drawing Theory | 2 |
| Art 118—Drawing | 3 |
| Art 120—Design | 2 |
| D.G.S. 112—Verbal Communication, or Rhet. 102—Rhetoric and Composition | 4 or 3 |
| D.S.G. 132—Biological Science, or Foreign Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

## Curriculum in Advertising Design

For the Degree of Bachelor of Fine Arts in Advertising Design

**IRST YEAR**

rogram for Freshmen (page 132)

| ECOND YEAR FIRST SEMESTER | 16 OR 17 HOURS |
|---|---|
| rt 111—Introduction to Ancient and Medieval Art | 3 |
| rt 123—Life Drawing and Anatomy | 5 |
| rt 131—Elementary Composition | 2 |
| rt 141—Still Life | 2 |
| hysical Education | 1 |
| lilitary (men) | 1 |
| lectives | 3 |

| SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 124—Life Drawing and Anatomy | 5 |
| Art 132—Elementary Composition | 2 |
| Art 142—Still Life | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| HIRD YEAR | 16 HOURS |
|---|---|
| rt History | 3 |
| rt 223—Figure Drawing and Sketch | 3 |
| rt 261—Layout and Lettering | 3 |
| rt 265—Advertising Design | 3 |
| ourn. 204—Typography | 2 |
| lectives | 2 |

| | 16 HOURS |
|---|---|
| Art 224—Figure Drawing and Sketch | 3 |
| Art 262—Layout and Lettering | 3 |
| Art 266—Advertising Design | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Electives | 4 |

| OURTH YEAR | 15 HOURS |
|---|---|
| rt 235—Illustration | 2 |
| rt 267—Advanced Advertising Design | 5 |
| lectives | 8 |

| | 13 TO 17 HOURS |
|---|---|
| Art 211—History of Art in Industry | 2 |
| Art 236—Illustration | 2 |
| Art 268—Advanced Advertising Design | 5 |
| Electives | 4 to 8 |

## Curriculum in the History of Art

For the Degree of Bachelor of Fine Arts in the History of Art

**IRST YEAR**

rogram for Freshmen (page 132)

| ECOND YEAR FIRST SEMESTER | 17 OR 18 HOURS |
|---|---|
| rt 111—Introduction to Ancient and Medieval Art | 3 |
| rt Elective (studio)[1] | 2 |
| ist. 111—Modern European History from the Renaissance to 1848 | 4 |
| anguage | 4 |
| peech 101—Principles of Effective Speaking | 3 |
| hysical Education | 1 |
| ilitary (men) | 1 |

| SECOND SEMESTER | 17 OR 18 HOURS |
|---|---|
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art Elective (studio) | 2 |
| Hist. 112—Modern European History from 1848 to the Present | 4 |
| Electives | 3 |
| Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

[1] Studio courses advised are: Art 125, 126, 131, 132, 141, 142.

| THIRD YEAR | 15 HOURS |
|---|---|
| Art History | 3 |
| Art Elective (studio) | 2 |
| Humanities 211—The Growth of American Culture | 4 |
| History or English[1] | 3 |
| Electives[2] | 3 |

| | 15 HOURS |
|---|---|
| Art History | 3 |
| Art Elective (studio) | 2 |
| Humanities 212—The Growth of American Culture | 4 |
| History or English | 3 |
| Phil. 101—Introduction to Philosophy | 3 |

| FOURTH YEAR | 14 TO 16 HOURS |
|---|---|
| Art History | 6 |
| Art Elective (studio) | 2 |
| Phil. 323—Philosophy of Art | 3 |
| Electives | 3 to 5 |

| | 14 TO 16 HOURS |
|---|---|
| Art History | 6 |
| Art Elective (studio) | 2 |
| Electives | 6 to 8 |

## Curriculum in Industrial Design

For the Degree of Bachelor of Fine Arts in Industrial Design

**FIRST YEAR**

Program for Freshmen (page 132)

| SECOND YEAR FIRST SEMESTER | 16 TO 18 HOURS |
|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 |
| Art 133—Design Workshop | 2 |
| Art 151—Sculpture | 2 |
| D.G.S. 141—Physical Science | 4 |
| Math. 117—Combined Freshman Mathematics, or Art 125—Life Drawing, and Art 141—Still Life | 5 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 134—Design Workshop | 2 |
| Art 152—Sculpture | 2 |
| D.G.S. 142—Physical Science | 4 |
| Math. 127—Combined Freshman Mathematics, or Art 124—Life Drawing, and Art 142—Still Life | 4 |
| Physical Education | 1 |
| Military (men) | |

| THIRD YEAR | 15 HOURS |
|---|---|
| Art 261—Layout and Lettering | 3 |
| Art 271—Materials and Processes | 2 |
| Art 275—Industrial Design | 3 |
| G.E.D. 104—Advanced Drawing | 4 |
| T.A.M. 171—Elements of Mechanics, or Art Elective | 3 |

| | 16 HOUR |
|---|---|
| Art 104—Interior Design | 3 |
| Art 262—Layout and Lettering | 3 |
| Art 272—Materials and Processes | 2 |
| Art 276—Industrial Design | 3 |
| Econ. 108—Elements of Economics | 3 |
| T.A.M. 172—Strength of Materials, or Art Elective | 3 |

| FOURTH YEAR | 14 HOURS |
|---|---|
| Advanced Art History | 3 |
| Art 277—Advanced Industrial Design | 5 |
| Mktg. 101—Principles of Marketing, or Mktg. 272—Industrial Selling | 3 |
| M.E. 182—Manufacturing Processes, or Social Sciences | 3 |

| | 14 TO 19 HOUR |
|---|---|
| Accy. 201—Fundamentals of Accounting, or Social Sciences | 3 |
| Art 211—History of Art in Industry | 3 |
| Art 278—Advanced Industrial Design | 5 |
| Electives | 4 to 9 |

[1] History or English requirements are to be chosen from the following: Hist. 181, 182, 301, 302, 304, 313, 314, 375, 376; D.G.S. 121, 122; Engl. 111, 112, 122, 131, 201, 313.

[2] Suggested electives: additional studio art courses; Classics 101, 103, 106, 110, 162; D.G.S. 161, 162, 171; Ed. 200, 300; Lib. Sci. 301; Music 110, 114, 117, 122, 123; Phil. 101, 102.

## Curriculum in Art Education

For the Degree of Bachelor of Fine Arts in Art Education

The courses outlined below total 132 to 138 hours. A minimum of 130 hours of credit, not counting the first two years of work in military training and physical education, is required for graduation. Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Desirable teaching combinations with art include English, French, industrial arts, Latin, and music.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 17 TO 19 HOURS |
|---|---|
| Arch. 171—Drawing Theory | 2 |
| Art 117—Drawing | 3 |
| Art 119—Design | 2 |
| D.G.S. 111—Verbal Communication, or Rhet. 101—Rhetoric and Composition | 4 or 3 |
| D.G.S. 131—Biological Science, or Foreign Language | 4 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 15 TO 17 HOURS |
|---|---|
| Arch. 172—Drawing Theory | 2 |
| Art 118—Drawing | 2 |
| Art 120—Design | 3 |
| D.G.S. 112—Verbal Communication, or Rhet. 102—Rhetoric and Composition | 4 or 3 |
| D.G.S. 132—Biological Science, or Foreign Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Art 125—Life Drawing | 2 |
| Art 131—Elementary Composition | 2 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Natural Science [1] | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 7 |

| | 17 OR 18 HOURS |
|---|---|
| Art 126—Life Drawing | 2 |
| Art 132—Elementary Composition | 2 |
| Art 141—Still Life | 2 |
| Natural Science [1] | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| THIRD YEAR | 18 HOURS |
|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 |
| Art 171-178—Crafts [2] | 2 |
| Art 203—Art Education Laboratory | 2 |
| Art 235—Illustration | 2 |
| Pol. Sci. 150—American Government | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Electives | 3 |

| | 18 HOURS |
|---|---|
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 171-178—Crafts [2] | 2 |
| Art 204—Art Education Laboratory | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Electives | 4 |

[1] Biology, botany, chemistry, general science, geography, geology, mathematics (excluding arithmetic), physics, physiology, and zoology, or their equivalents in integrated courses.

[2] Select any of the following two-hour craft courses offered by the Department of Art provided the necessary prerequisites are met: 171 and 172, Metalwork and Jewelry; 173 and 174, Pottery; 175 and 176, Leatherwork; 177 and 178, Bookbinding.

| FOURTH YEAR | 15 HOURS | | 15 HOURS |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Advanced Art History | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 or 4 | Art 101—Water Color | 2 |
| Ed. 242—Educational Practice in Secondary Education | 5 | Art 171-178—Crafts [1] | 2 |
| Electives | 3 or 4 | Art 261—Layout and Lettering | 3 |
| | | Electives | 5 |

For the Degree of Master of Fine Arts in Art Education

| FIFTH YEAR | 4 UNITS | | 4 UNITS |
|---|---|---|---|
| Art 493—Seminar | 1 | Advanced Art History | ¾ |
| Two of the following: | | Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 301—Philosophy of Education | ½ | Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 302—History of American Education | ½ | Art Electives | 2¼ |
| Ed. 303—Comparative Education | ½ | | |
| Ed. 304—Social Foundations of Education | ½ | | |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education (Art) | 1 | | |
| Electives | 1 | | |

## Teacher Education Minor in Art Education

| | HOURS |
|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 |
| Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 125—Life Drawing | 2 |
| Art 131—Elementary Composition | 2 |
| Art 188—Introduction to Art Form | 2 |
| Art 189—Introduction to Art Form | 2 |
| Art 204—Art Education Laboratory | 2 |
| Crafts Elective [1] | 2 |
| Total | 18 |

## Curriculum in Painting

For the Degree of Bachelor of Fine Arts in Painting

FIRST YEAR

Program for Freshmen (page 132)

| SECOND YEAR FIRST SEMESTER | 16 OR 17 HOURS | SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|---|---|
| Art 111—Introduction to Ancient and Medieval Art | 3 | Art 112—Introduction to Renaissance and Modern Art | 3 |
| Art 123—Life Drawing and Anatomy | 5 | Art 124—Life Drawing and Anatomy | 5 |
| Art 131—Elementary Composition | 2 | Art 132—Elementary Composition | 2 |
| Art 141—Still Life | 2 | Art 142—Still Life | 2 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives | 3 | Electives | 3 |

[1] Select any of the following two-hour craft courses offered by the Department of Art provided the necessary prerequisites are met: 171 and 172, Metalwork and Jewelry; 173 and 174, Pottery; 175 and 176, Leatherwork; 177 and 178, Bookbinding.

| THIRD YEAR | 16 HOURS | | 16 HOURS |
|---|---|---|---|
| Art History | 3 | Art History | 3 |
| Art 221—Life Drawing and Portrait | 5 | Art 222—Life Drawing and Portrait | 5 |
| Art 231—Intermediate Composition | 3 | Art 232—Intermediate Composition | 3 |
| Art 235—Illustration, or Art 255—Graphic Arts | 2 | Art 236—Illustration, or Art 256—Graphic Arts | 2 |
| English or American Literature | 3 | English or American Literature | 3 |
| **FOURTH YEAR** | **14 TO 16 HOURS** | | **14 TO 16 HOURS** |
| Art 233—Advanced Composition | 4 | Art 234—Advanced Composition | 4 |
| Art 241—Life Painting | 4 | Art 242—Life Painting | 4 |
| Art 341—Painting Materials and Techniques | 2 | Art Electives[1] | 2 |
| Art Electives[1] | 2 | Electives | 4 to 6 |
| Electives | 2 to 4 | | |

## Curricula in Landscape Architecture

The first and second years are common to both curricula in landscape architecture.

| FIRST YEAR FIRST SEMESTER | 15 OR 16 HOURS | SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|---|---|
| Art 119—Design | 2 | Bot. 100—General Botany | 4 |
| Art 181—Freehand Drawing | 2 | G.E.D. 108—Architectural Projections | 2 |
| G.E.D. 107—Architectural Projections | 2 | L.A. 132—Elements of Landscape Architecture | 3 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 | Math. 104—Elements of Algebra and Trigonometry | 3 |
| L.A. 111—History of Landscape Architecture | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Physical Education | 1 |
| Physical Education | 1 | Military (men) | 1 |
| Military (men) | 1 | | |
| **SECOND YEAR** | **15 OR 16 HOURS** | | **17 OR 18 HOURS** |
| Arch. 175—Frame Construction Details | 2 | Arch. 176—Masonry Construction Details | 2 |
| C.E. 117—Surveying for Landscape Architects | 3 | Art 182—Freehand Drawing | 2 |
| English or American Literature | 3 | C.E. 118—Surveying for Landscape Architects | 3 |
| L.A. 133—Elementary Landscape Design | 3 | English or American Literature | 3 |
| Speech 101—Principles of Effective Speaking | 3 | L.A. 134—Elementary Landscape Design | 3 |
| Physical Education | 1 | Rhet. 133—Expository Writing | 3 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |

## Curriculum in Landscape Architecture

For the Degree of Bachelor of Fine Arts in Landscape Architecture

**FIRST AND SECOND YEARS**

Program for Freshmen and Sophomores (see above)

[1] Art 235 and 236 required if not taken previously.

| THIRD YEAR | FIRST SEMESTER | 16 HOURS |
|---|---|---|
| L.A. 213—Development and Theory of Contemporary Landscape Architecture | | 3 |
| L.A. 235—Design of Recreational Areas | | 4 |
| L.A. 243—Landscape Construction | | 3 |
| L.A. 251—Trees and Shrubs | | 3 |
| Approved Electives | | 3 |

| SECOND SEMESTER | 16 HOU |
|---|---|
| History of Architecture | |
| L.A. 236—Intermediate Landscape Design | |
| L.A. 244—Landscape Construction | |
| L.A. 252—Trees and Shrubs | |
| Approved Electives | |

| FOURTH YEAR | 16 HOURS |
|---|---|
| L.A. 237—Advanced Landscape Design | 4 |
| L.A. 253—Planting Design | 4 |
| L.A. 255—Care of Plant Materials | 2 |
| L.A. 274—Regional Planning | 3 |
| Approved Electives | 3 |

| | 16 HOU |
|---|---|
| L.A. 238—Advanced Landscape Design | |
| L.A. 246—Office Practice | |
| L.A. 254—Planting Design | |
| L.A. 272—Planning of Towns and Cities | |
| Approved Electives | |

## Curriculum in Landscape Operation

For the Degree of Bachelor of Science in Landscape Operation

FIRST AND SECOND YEARS

Program for Freshmen and Sophomores (page 137)

| THIRD YEAR | FIRST SEMESTER | 15 HOURS |
|---|---|---|
| Accy. 201—Fundamentals of Accounting | | 3 |
| Entom. 101—Destructive and Useful Insects | | 3 |
| L.A. 243—Landscape Construction | | 3 |
| L.A. 251—Trees and Shrubs | | 3 |
| Electives | | 3 |

| SECOND SEMESTER | 17 HOU |
|---|---|
| Bus. Law 261—Summary of Business Law | |
| Journ. 281—Introduction to Advertising | |
| L.A. 244—Landscape Construction | |
| L.A. 252—Trees and Shrubs | |
| Rhet. 151—Business Letter Writing | |
| Electives | |

| FOURTH YEAR | 16 HOURS |
|---|---|
| L.A. 235—Intermediate Landscape Design | 4 |
| L.A. 253—Planting Design | 4 |
| L.A. 255—Care of Plant Materials | 2 |
| Electives | 6 |

| | 16 HOU |
|---|---|
| L.A. 236—Intermediate Landscape Design | |
| L.A. 246—Office Practice | |
| L.A. 248—Advanced Landscape Construction | |
| L.A. 254—Planting Design | |
| L.A. 272—Planning of Towns and Cities | |

## Curriculum in Music

For the Degree of Bachelor of Music

### Instrumental Major

The instrumental major may be taken in piano, violin, viola, violoncello, string ba organ, flute, clarinet, oboe, bassoon, alto saxophone, cornet, French horn, trombo baritone, tuba, percussion, harp, or band and orchestral instruments.

A student enrolled in this curriculum takes two applied subjects, one a major (thir two hours) and the other a minor (twelve hours). In the band and orchestral inst ments major, the major applied music subject includes work on supplementary band a orchestral instruments and conducting. Eight hours are required in the minor subje

A placement examination in theory is given on entrance. Students who fail to pass are required to take Music 100, Rudiments of Theory (two hours), before registering in Music 102.

Music 210 and 211, Instrumentation, are required of band and orchestra majors instead of Music 302 and 303. Organ majors are required to take two semesters of Music 306 (three hours each semester) for work in double counterpoint, canon, and fugue instead of Music 302 and 303. Piano majors may elect Music 306 for three or five hours credit instead of Music 302 and 303. Music 266 is required of piano, voice, and string majors only.

| FIRST YEAR — FIRST SEMESTER | 14 TO 16 HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 102—Theory of Music | 4 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 103—Theory of Music | 4 |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 106—Theory of Music | 4 |
| Music 120—Introduction to the History of Music | 2 |
| French, German, or Italian | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 107—Theory of Music | 4 |
| Music 121—Introduction to the History of Music | 2 |
| French, German, or Italian | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 15½ HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 226—History of Music | 2 |
| Music 300—Theory of Music | 2 |
| Music 314—Analysis of Musical Form | 2 |
| Music Ensemble | ½ |
| Electives | 3 |

| | 15½ HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Minor Applied Music Subject | 2 |
| Music 227—History of Music | 2 |
| Music 301—Theory of Music | 2 |
| Music 315—Analysis of Musical Form | 2 |
| Music Ensemble | ½ |
| Electives | 3 |

| FOURTH YEAR | 14½ TO 17½ HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Music 266—Applied Music Pedagogy | 1 |
| Music 302—Theory of Music | 2 |
| Music 320—Advanced History of Music | 2 |
| Music Ensemble | ½ |
| Electives | 5 to 8 |

| | 14½ TO 17½ HOURS |
|---|---|
| Major Applied Music Subject | 4 |
| Music 266—Applied Music Pedagogy | 1 |
| Music 303—Theory of Music | 2 |
| Music 321—Advanced History of Music | 2 |
| Music Ensemble | ½ |
| Electives | 5 to 8 |

## Voice Major

The major applied music subject throughout the course includes classes in singing diction as well as private lessons in voice. At least eight hours each of Italian, French, and German are required for the voice major. Two years of high school language are equivalent to eight hours of University credit in language.

| FIRST YEAR FIRST SEMESTER | 14 TO 16 HOURS |
|---|---|
| Music 102—Theory of Music | 4 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 180—Voice Diction (English) | 1 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 TO 18 HOUR |
|---|---|
| Music 103—Theory of Music | |
| Music 160—Piano | |
| Music 161—Voice | |
| Music 181—Voice Diction (Italian) | |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or |
| Hygiene 101—Health Lectures | |
| Physical Education | |
| Military (men) | |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Music 106—Theory of Music | 4 |
| Music 120—Introduction to the History of Music | 2 |
| Music 160—Piano | 2 |
| Music 161—Voice | 3 |
| Music 182—Voice Diction (German) | 1 |
| Foreign Language | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOUI |
|---|---|
| Music 107—Theory of Music | |
| Music 121—Introduction to the History of Music | |
| Music 160—Piano | |
| Music 161—Voice | |
| Music 183—Voice Diction (German) | |
| Foreign Language | |
| Physical Education | |
| Military (men) | |

| THIRD YEAR | 16½ HOURS |
|---|---|
| Minor Applied Music Subject | 2 |
| Music Ensemble | ½ |
| Music 226—History of Music | 2 |
| Music 300—Theory of Music | 2 |
| Music 314—Analysis of Musical Form | 2 |
| Music 361—Voice | 3 |
| Music 380—Voice Diction (French) | 1 |
| Foreign Language | 4 |

| | 16½ HOU |
|---|---|
| Minor Applied Music Subject | |
| Music Ensemble | ½ |
| Music 227—History of Music | |
| Music 301—Theory of Music | |
| Music 315—Analysis of Musical Form | |
| Music 361—Voice | |
| Music 381—Voice Diction (French) | |
| Foreign Language | |

| FOURTH YEAR | 13½ TO 16½ HOURS |
|---|---|
| Music Ensemble | ½ |
| Music 266—Applied Music Pedagogy | 1 |
| Music 320—Advanced History of Music | 2 |
| Music 361—Voice | 3 |
| Music 382—Voice Diction | 1 |
| Electives | 6 to 9 |

| | 13½ TO 16½ HOU |
|---|---|
| Music Ensemble | ½ |
| Music 266—Applied Music Pedagogy | 1 |
| Music 321—Advanced History of Music | 2 |
| Music 361—Voice | 3 |
| Music 382—Voice Diction | 1 |
| Electives | 6 to |

## Theory Major

A student may take a major in theory of music only on recommendation of th Theory Division. The complete theory course offered in the instrumental major must b completed. Music 210, 211, and 306 must be taken in the third and fourth years. recital of original compositions is required.

The student will continue the study of applied music for major credit throughou three years of his course of study. Whether or not piano is the major instrument, the stu dent should acquire a thorough practical knowledge of the pianoforte. He will spend least one semester each in the study of three instruments, one in each section of th orchestra, i.e., string, woodwind, and brass.

## Curriculum in Music Education

For the Degree of Bachelor of Science in Music Education

The minimum requirements for teaching music in the primary and secondary schoo are (1) that the teacher be sufficiently proficient on the piano to play accompaniments

music education materials and to play at sight such materials as hymns, community songs, and folk songs; and (2) that he have a sufficient knowledge of voice to sing with a pleasant tone quality, to sing at sight, and to be able to impart the principles of voice production. Students who can not meet these requirements must take additional work in the branches of applied music in which they are deficient.

The courses outlined below total 134 to 138 hours. A minimum of 130 semester hours, plus the requirements of the first two years of work in military training and physical education, is required for graduation.

At the end of the sophomore year, a committee will investigate each music education student. The following points will be taken into consideration: musicianship, scholarship standing, personality, and leadership. The exceptionally good music students will be permitted to use music as a minor area of specialization. Those students who present an acceptable music minor already within their curriculum will be required to take a minimum of sixteen hours of electives in the following: art, social studies (especially courses concerned with current social problems), biological science, and physical science. Other students will be requested to select a non-music subject as a minor area of specialization and accumulate a minimum of sixteen hours in the area. Desirable teaching combinations with music include art, English, French, German, Latin, physical education, and Spanish.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

## Piano and Voice Major

| FIRST YEAR FIRST SEMESTER | 15 OR 16 HOURS |
|---|---|
| Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 |
| Music 102—Theory of Music | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 OR 18 HOURS |
|---|---|
| Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject | 2 |
| D.G.S. 112—Verbal Communication[1] | 4 |
| Music 103—Theory of Music | 4 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject | 2 |
| Music 106—Theory of Music | 4 |
| Music 184—String Instruments | 2 |
| Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied Music Subject | 4 |
| Secondary Applied Music Subject[2] | 2 |
| Music 107—Theory of Music | 4 |
| Music 184—String Instruments | 2 |
| Wind Instruments | 2 |
| Music Ensemble | ½ |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

[1] Rhet. 101, 102, and Speech 141 or 101 may be taken instead of D.G.S. 111 and 112.

[2] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours in excess of the 130 hours required for graduation.

| THIRD YEAR | 17½ HOURS |
|---|---|
| Music 184—String Instruments | 2 |
| Wind Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 |
| Music 224—History and Appreciation of Music | 2 |
| Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Electives | 5 |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Music 210—Instrumentation | 2 |
| Music 217—Instrumental School Music and Conducting | 3 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 232—Educational Practice in Elementary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 3 |

| | 17½ HOUR |
|---|---|
| Music 184—String Instruments | |
| Wind Instruments | |
| Music 215—Senior High School Choral Music and Conducting | |
| Music 225—History and Appreciation of Music | |
| Music Ensemble | ½ |
| Pol. Sci. 150—American Government | |
| Electives | |

| | 16 HOUR |
|---|---|
| Music 211—Instrumentation | |
| Wind Instruments | |
| Hist. 152—History of the United States, 1865-1952 | |
| Physics 232—Physics of Music | |
| Electives | |

## Wind Instrument Major

| FIRST YEAR FIRST SEMESTER | 15 OR 16 HOURS |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 102—Theory of Music | 4 |
| Music 160—Piano | 2 |
| D.G.S. 111—Verbal Communication[1] | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 OR 18 HOUR |
|---|---|
| Principal Applied Wind Instrument | |
| Wind Instruments | |
| Music 103—Theory of Music | |
| Music 160—Piano | |
| D.G.S. 112—Verbal Communication[1] | |
| Hygiene 101—Health Lectures | |
| Physical Education | |
| Military (men) | |

| SECOND YEAR | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied Wind Instrument | 2 |
| Wind Instruments | 2 |
| Music 106—Theory of Music | 4 |
| Music 160—Piano | 2 |
| Music 184—String Instruments | 2 |
| Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17½ OR 18½ HOUR |
|---|---|
| Principal Applied Wind Instrument | |
| Wind Instruments | |
| Music 107—Theory of Music | |
| Music 160—Piano[2] | |
| Music 184—String Instruments | |
| Music Ensemble | ½ |
| Ed. 101—The Nature of the Teaching Profession | |
| Physical Education | |
| Military (men) | |
| Electives | |

[1] Rhet. 101, 102, and Speech 141 or 101 may be taken instead of D.G.S. 111 and 112.

[2] A test is given in this subject. If the student has not attained adequate proficiency, he will b required to take from two to four hours work in excess of the 130 hours required for graduatio

| THIRD YEAR | 17½ HOURS | | 17½ HOURS |
|---|---|---|---|
| Principal Applied Wind Instrument | 2 | Principal Applied Wind Instrument | 2 |
| Music 161—Voice | 2 | Music 161—Voice[1] | 2 |
| Music 184—String Instruments | 2 | Music 184—String Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 | Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 224—History and Appreciation of Music | 2 | Music 225—History and Appreciation of Music | 2 |
| Music Ensemble | ½ | Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 | Electives | 6 |
| Ed. 240—Principles of Secondary Education | 2 | | |
| Electives | 3 | | |

| FOURTH YEAR | 16 HOURS | | 16 HOURS |
|---|---|---|---|
| Music 210—Instrumentation | 2 | Music 211—Instrumentation | 2 |
| Music 217—Instrumental School Music and Conducting | 3 | Hist. 152—History of the United States, 1865-1952 | 3 |
| Ed. 211—Educational Psychology | 3 | Physics 232—Physics of Music | 2 |
| Ed. 232—Educational Practice in Elementary Education | 2 | Pol. Sci. 150—American Government | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Electives | 6 |
| Ed. 242—Educational Practice in Secondary Education | 3 | | |

## Timpani and Percussion Major

The program for the timpani and percussion major is identical with that for the wind instrument major except that two hours of Principal Applied Percussion Instrument is substituted for two hours of Principal Applied Wind Instrument during each semester of the first three years.

## String Instrument Major

| FIRST YEAR FIRST SEMESTER | 15 OR 16 HOURS | SECOND SEMESTER | 17 OR 18 HOURS |
|---|---|---|---|
| Principal Applied String Instrument | 4 | Principal Applied String Instrument | 4 |
| Music 160—Piano | 2 | Music 160—Piano | 2 |
| Music 102—Theory of Music | 4 | Music 103—Theory of Music | 4 |
| D.G.S. 111—Verbal Communication[2] | 4 | D.G.S. 112—Verbal Communication[2] | 4 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| | | Military (men) | 1 |

[1] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours work in excess of the 130 hours required for graduation.

[2] Rhet. 101, 102, and Speech 141 or 101 may be taken instead of D.G.S. 111 and 112.

| SECOND YEAR | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 |
| Music 160—Piano | 2 |
| Wind Instruments | 2 |
| Music 106—Theory of Music | 4 |
| Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17½ OR 18½ HOUR |
|---|---|
| Principal Applied String Instrument | |
| Music 184—String Instruments | |
| Music 160—Piano[1] | |
| Wind Instruments | |
| Music 107—Theory of Music | |
| Music Ensemble | ½ |
| Ed. 101—The Nature of the Teaching Profession | |
| Physical Education | |
| Military (men) | |
| Electives | |

| THIRD YEAR | 17½ HOURS |
|---|---|
| Principal Applied String Instrument | 2 |
| Music 250—String Ensemble | 1 |
| Music 161—Voice | 2 |
| Wind Instruments | 2 |
| Music 214—Elementary and Junior High School Music | 2 |
| Music 224—History and Appreciation of Music | 2 |
| Music Ensemble | ½ |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Electives | 2 |

| | 17½ HOUR |
|---|---|
| Principal Applied String Instrument | |
| Music 250—String Ensemble | |
| Music 161—Voice[1] | |
| Wind Instruments | |
| Music 215—Senior High School Choral Music and Conducting | |
| Music 225—History and Appreciation of Music | |
| Music Ensemble | ½ |
| Electives | |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Music 210—Instrumentation | 2 |
| Music 217—Instrumental School Music and Conducting | 3 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 232—Educational Practice in Elementary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 3 |

| | 16 HOUR |
|---|---|
| Hist. 152—History of the United States, 1865-1952 | |
| Music 211—Instrumentation | |
| Physics 232—Physics of Music | |
| Pol. Sci. 150—American Government | |
| Electives | |

## String Instrument Major (Irregular Entrance)

Because of the great need for teachers of string instruments in the public school exceptional students who have had no string training will be permitted to enroll in th curriculum provided they can pass the entrance examination in voice, piano, or on a win instrument. These students will follow the curriculum outlined below.

| FIRST YEAR FIRST SEMESTER | 15 OR 16 HOURS |
|---|---|
| Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 |
| Music 160—Piano | 2 |
| Music 102—Theory of Music | 4 |
| D.G.S. 111—Verbal Communication[2] | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 OR 18 HOUR |
|---|---|
| Principal Applied String Instrument | |
| Music 184—String Instruments | |
| Music 160—Piano | |
| Music 103—Theory of Music | |
| D.G.S. 112—Verbal Communication[2] | |
| Hygiene 101—Health Lectures | |
| Physical Education | |
| Military (men) | |

[1] A test is given in this subject. If the student has not attained adequate proficiency, he will l required to take from two to four hours of work in excess of the 130 hours required for graduatio

[2] Rhet. 101, 102, and Speech 141 or 101 may be taken instead of D.G.S. 111 and 112.

| SECOND YEAR | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 |
| Music 160—Piano | 2 |
| Wind Instruments | 2 |
| Music 106—Theory of Music | 4 |
| Music Ensemble | ½ |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17½ OR 18½ HOURS |
|---|---|
| Principal Applied String Instrument | 2 |
| Music 184—String Instruments | 2 |
| Music 160—Piano[1] | 2 |
| Wind Instruments | 2 |
| Music 107—Theory of Music | 4 |
| Music Ensemble | ½ |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 |

**THIRD AND FOURTH YEARS**

The third and fourth years are the same as those of a regular string instrument major.

For the Degree of Master of Science in Music Education

| FIFTH YEAR | 4 UNITS |
|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Music Electives[2] | 2 |
| Electives[2] | 1 |

| | 4 UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Music 427—Administration and Supervision of Music Education | 1 |
| Music Electives[2] | 1 |
| Electives[2] | 1 |

## Teacher Education Minors in Music

### Instrumental Minor

| | HOURS |
|---|---|
| Music 160—Piano, or Music 163—Violin, or Music 164-176—Band and Orchestral Instruments (to be chosen with consent of adviser) | 4 |
| Music 184—String Instruments | 4 |
| Music 190, 192, 194, 196, 198—Wind Instruments[3] | 4 |
| Music 217—Instrumental School Music and Conducting | 3 |
| Music 224 or 225—History and Appreciation of Music | 2 |
| Total | 17 |

[1] A test is given in this subject. If the student has not attained adequate proficiency, he will be required to take from two to four hours of work in excess of the 130 hours required for graduation.
[2] Of the five units of electives in the fifth year, a maximum of two units is allowed in applied music.
[3] Students are required to take two of these courses.

### Vocal Minor

| | |
|---|---|
| Music 100—Rudiments of Theory | 2 |
| Music 160—Piano | 4 |
| Music 161—Voice | 4 |
| Music 214—Elementary and Junior High School Music | 2 |
| Music 215—Senior High School Choral Music and Conducting | 3 |
| Music 224 or 225—History and Appreciation of Music | 2 |
| Music Ensemble—Vocal Dictions | 1 |
| Total | 18 |

### University of Illinois Bands

The University Bands are organized into the Concert Band, the First Regimental Band, and the Second Regimental Band. Membership in these organizations is determined by a playing examination, and assignments are made according to proficiency and instrumentation. Credit in the Bands may be substituted for credit in required military courses. Members of the Concert Band who have satisfied their military requirements are eligible for stipends amounting approximately to the tuition fees for Illinois residents.

The Bands play numerous concerts on the campus, and the Concert Band also appears in many Illinois and other midwestern cities. In addition, the Bands furnish music for Commencement, convocations, athletic events, military ceremonies, and other occasions. The University owns a large library of band music and was bequeathed the John Philip Sousa Memorial Library. These collections comprise one of the largest and finest libraries of band music in the word.

The Concert Band maintains a complete symphonic instrumentation for the study and performance of all types of band literature and is open to those who have attained a high level of musical and technical proficiency on their instruments. The First Regimental Band maintains the instrumentation of the standard band and serves as a training organization for the Concert Band. The Second Regimental Band enrolls those who do not at first qualify for positions in the other bands, with eligibility for promotion as improvement is shown and vacancies occur. Membership, particularly in the Concert and First Regimental Bands, is open to women students as well as men.

Further information may be obtained by addressing the Director of University Bands, Band Building, Urbana.

Journalism students in photographic laboratory.

# School of Journalism and Communications

For those who have had two years of college work, the School of Journalism and Communications offers an additional two years of professional training, leading to the degree of Bachelor of Science.

The editorial curriculum is designed for those wishing to prepare themselves for positions as editors, reporters, and writers for newspapers, magazines, and technical publications. The advertising curriculum is intended especially for those expecting to enter the advertising departments of newspapers, magazines, radio stations, industrial organizations, or retail stores. The publication management curriculum is planned for those who are particularly interested in management and circulation, community weeklies, or in trade and technical publications. The radio curriculum prepares students for all forms of radio journalism. Instruction in this curriculum makes use of the radio facilities operated jointly by Radio Station WILL and the School of Journalism and Communications.

Instruction in journalism at the University was begun in 1902 as part of the courses in rhetoric and was organized as a division of the Department of English in 1916. The School of Journalism was established in 1927 as a separate administrative unit, and in 1941 it was moved into quarters designed especially for its use in Gregory Hall. In 1950 the name was changed to School of Journalism and Communications with divisions of journalism, radio, and advertising.

The four curricula of the School of Journalism and Communications—editorial, advertising, publication management, and radio—have been accredited by the American Council on Education for Journalism. The standing of the school has been endorsed by the American Society of Newspaper Editors, American Newspaper Publishers Association, Southern Newspaper Publishers Association, Inland Daily Press Association, National Editorial Association, Illinois Press Association, International Circulation Managers Association, Council on Radio Journalism, and the Newspaper Advertising Executives Association.

### JOURNALISM LIBRARY, LABORATORIES, AND EQUIPMENT

In its quarters in Gregory Hall the School of Journalism and Communications trains communications workers with modern equipment which includes the journalism library containing 6,300 books, the morgue, newspaper files, newsrooms, photography and photoengraving darkrooms, radio classrooms and broadcasting studios, printing laboratory, advertising layout laboratory, and community journalism facilities.

Radio students make use of portable tape recorders for assignments. Both newspaper and radio wire copy come to the copy desks for use by the student editors. Typography students study the engraving and stereotyping processes, and photographers have a completely equipped laboratory with ten darkrooms, workrooms, and studio. Press cameras are available for classroom and outside assignments.

### PREJOURNALISM PREPARATION

Students planning to enter the School of Journalism and Communications are advised to register as prejournalism freshmen and sophomores following either the general curriculum or that of the Division of General Studies in the College of Liberal Arts and Sciences. The prejournalism student will find it to his advantage to include in his freshman and sophomore program courses in rhetoric and composition, ten hours of science (which may include mathematics), and twelve hours of social sciences (history, political science, economics, sociology, and psychology). The ability to use a typewriter is essential to satistactory progress in the journalism curricula. A reasonable degree of typing ability should be acquired before entering the school. Those who do not have the ability will be asked to take a non-credit course in typewriting.

### REQUIREMENTS FOR ADMISSION

For admission to the School of Journalism and Communications as a candidate for a degree, a student must meet the following requirements:

1. Complete fifty-six semester hours of undergraduate college work, exclusive of the required courses in military and physical education.
2. Present a grade-point average of 3.5. No applicant whose grade-point average in all college work is less than 3.5 will be admitted except on approval by the school of an individual petition for admission.

Students from schools of journalism of approved standing who comply with the requirements for admission to the School of Journalism and Communications at the University may receive by transfer not more than one year of credit in the School. Not more than half of the thirty hours of journalism required for a degree may be transferred from other schools or colleges.

### REQUIREMENTS FOR GRADUATION

The School of Journalism and Communications offers four programs of study leading to the degree of Bachelor of Science in Journalism: editorial, advertising, publication management, and radio. The requirements for this degree (in addition to the general University requirements as to registration, residence, scholarship, fees, and courses in hygiene, military training, physical education, and rhetoric) include:

1. A total of 124 hours of credit, not counting the first two years in military and physical education.
2. Not less than thirty hours nor more than forty hours in journalism, and twenty hours in advanced social studies, arts, and sciences, and in other subjects taken in the third or fourth year and approved by the faculty.
3. Completion of the requirements of one of the four curricula offered by the school.
4. The student must obtain an average grade of "C" in courses taken at the University and presented for the degree. The fifty-six hours required for admission to the School of Journalism and Communications are not included in the computation.
5. The home economics minor may be substituted for the requirement of twenty hours in advanced social studies.

### HONORS AT GRADUATION

For graduation with Honors a student must obtain an average of 4.35 in all courses taken after admission to the school; and for graduation with High Honors, an average of 4.75.

## Editorial Curriculum

For the Degree of Bachelor of Science in Journalism

| THIRD YEAR | HOURS |
|---|---|
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 212—Reporting Practice | 3 |
| Journ. 217—History of Journalism, or Journ. 218—The Press and Public Opinion | 3 |
| Journ. 281—Introduction to Advertising, or Journ. 241—Newspaper Management, or Journ. 244—Community Newspaper Publication | 3 |

| FOURTH YEAR | HOURS |
|---|---|
| Journ. 227—Magazine Article Writing, or Journ. 328—Industrial Publications, or Journ. 320—Editorial Studies and Writing, or Journ. 365—Radio News | 2 or 3 |
| Journ. 311—Newspaper Law | 3 |
| Journ. 321—Copyreading | 4 |
| Journ. 323—Advanced Reporting | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of required and elective journalism courses to meet the minimum requirement of thirty hours, and enough hours of general electives to meet the requirement of 124 hours for graduation.

## Advertising Curriculum

For the Degree of Bachelor of Science in Journalism

| THIRD YEAR | HOURS |
|---|---|
| Econ. 108—Elements of Economics | 3 |
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Journ. 382—Advertising Copy and Layout | 4 |
| Mktg. 101—Principles of Marketing | 3 |

| FOURTH YEAR | HOURS |
|---|---|
| Journ. 283—Current Advertising Developments | 1 |
| Journ. 383—Advertising Media | 2 |
| Journ. 384—Advertising Campaigns | 3 |
| Journ. 385—Advertising Promotion and Sales, or Journ. 386—Radio Advertising | 3 or 2 |
| Mktg. 321—Marketing Research and Policies, or Mktg. 211—Principles of Retailing | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of required and elective journalism courses to meet the minimum requirement of thirty hours, and enough hours of general electives to meet the requirement of 124 hours for graduation.

### ELECTIVES

Recommended list of electives in other colleges to be taken in the third or fourth year and approved as counting toward the twenty hours required in social sciences:

| | HOURS |
|---|---|
| Art 181—Freehand Drawing, or Art 188—Introduction to Art Form | 2 |
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 170—Elements of Statistics, or Math. 161—Statistics | 3 |
| Econ. 240—Labor Problems | 3 |
| Econ. 379—Consumer Economics | 3 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Mktg. 211—Principles of Retailing | 3 |
| Mktg. 271—Salesmanship | 2 |
| Mktg. 315—Retail Buying | 2 |
| Mktg. 323—Problems in Business Research | 3 |
| Mktg. 373—Sales Management | 2 |
| Psych. 100—Introduction to Psychology | 4 |

| | |
|---|---|
| Psych. 226—Emotion and Motivation | 3 |
| Psych. 255—Social Psychology | 3 |
| Rhet. 272—Report Writing | 2 |
| Sociol. 100—Principles of Sociology | 3 |
| Sociol. 243—Social Evolution | 3 |
| Sociol. 270—Population and Human Ecology | 3 |
| Sociol. 271—Sociology of the Region | 3 |

## Publication Management Curriculum

For the Degree of Bachelor of Science in Journalism

| THIRD YEAR | HOURS |
|---|---|
| Accy. 201—Fundamentals of Accounting[1] | 3 |
| Econ. 108—Elements of Economics[1] | 3 |
| Journ. 204—Typography | 2 |
| Journ. 211—Reporting | 3 |
| Journ. 212—Reporting Practice | 3 |
| Journ. 241—Newspaper Management | 3 |
| Journ. 281—Introduction to Advertising | 3 |
| Journ. 382—Advertising Copy and Layout | 4 |

| FOURTH YEAR | HOURS |
|---|---|
| Journ. 217—History of Journalism, or Journ. 218—The Press and Public Opinion | 3 |
| Journ. 244—Community Newspaper Publication, or Journ. 328—Industrial Publications | 3 or 2 |
| Journ. 311—Newspaper Law, or Journ. 321—Copyreading | 3 or 4 |
| Journ. 343—Newspaper Circulation Problems, or Journ. 385—Advertising Promotion and Sales | 3 |

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of journalism electives for a total of thirty hours in required and elective journalism courses, and enough hours of general electives to meet the requirement of 124 hours for graduation.

During their fourth year, students are advised to elect course combinations in line with their field of specialization as follows: Trade and Technical Publication Management (Journ. 328 and 343, or 385); Community Newspaper Management (Journ. 244 and 343, or 385); Daily Newspaper Management (Journ. 343 or 385).

### ELECTIVES

Recommended list of electives in other colleges to be taken in the third or fourth year and approved as counting toward the twenty hours required in social sciences:

| | HOURS |
|---|---|
| Bus. Law 261—Summary of Business Law | 3 |
| Econ. 170—Elements of Statistics, or Econ. 171—Applied General Statistics, or Math. 161—Statistics | 3 |
| Econ. 240—Labor Problems | 3 |
| Econ. 246—Economics of Trade Unionism | 3 |
| Econ. 248—Personnel Administration | 3 |
| Econ. 250—Money, Credit, and Banking | 3 |
| L.A. 274—Regional Planning | 3 |
| Mgmt. 301—Management in Manufacturing | 3 |
| Mktg. 101—Principles of Marketing | 3 |
| Mktg. 211—Principles of Retailing | 3 |
| Mktg. 271—Salesmanship | 2 |
| Pol. Sci. 110—Government in Illinois | 2 |
| Pol. Sci. 305—Municipal Government | 3 |
| Pol. Sci. 306—Municipal Problems | 3 |
| Pol. Sci. 310—Rural Local Government | 3 |
| Pol. Sci. 351—American Constitutional System | 3 |

[1] Students who present credit for a course in accounting and a course in elementary economics for entrance to the School of Journalism and Communications should choose electives or advanced social studies instead of Accy. 201 and Econ. 108.

| | |
|---|---|
| Psych. 255—Social Psychology | 3 |
| Sociol. 100—Principles of Sociology | 3 |
| Sociol. 276—Sociology of the City | 3 |
| Sociol. 277—Rural Sociology | 3 |

## Radio Curriculum

For the Degree of Bachelor of Science in Journalism

The curriculum in radio journalism is designed to prepare students for all forms of radio work.

Students must complete eighteen hours in radio, including Journ. 261 (Principles of Radio and Television Broadcasting) and Journ. 368 (Radio and Television Regulation). All radio students are required to take Journ. 211 (Reporting).

Each student during the third and fourth years is required to take twenty hours of advanced social studies, enough hours of journalism electives for a total of thirty hours in required and elective journalism courses, and enough hours of general electives to meet the requirement of 124 hours for graduation.

A minimum of eighteen hours must be chosen from the radio courses listed below:

| | HOURS |
|---|---|
| Journ. 261—Principles of Radio and Television Broadcasting | 2 |
| Journ. 263—Radio Announcing | 2 |
| Journ. 264—Radio Acting | 2 |
| Journ. 265—Radio Continuity Writing | 2 |
| Journ. 266—Radio Dramatic Writing | 3 |
| Journ. 267—Radio Production and Direction | 3 |
| Journ. 362—Radio Station Management | 2 |
| Journ. 365—Radio News | 3 |
| Journ. 366-367—Advanced Radio Practices | 2 |
| Journ. 368—Radio and Television Regulation | 2 |
| Journ. 386—Radio and Television Advertising | 2 |

## Minor in Home Economics for Journalism Majors

For a minor in home economics the student must complete a minimum of twenty hours in home economics, including seven hours of required courses as indicated below:

| Required Courses: | HOURS |
|---|---|
| Home Econ. 120—Elementary Nutrition, or Home Econ. 130—Introduction to Foods and Nutrition | 2 |
| Home Econ. 180—Selection and Care of Textiles | 3 |
| Home Econ. 271—Home Management | 2 |
| Electives | 13 |
| Total | 20 |

| Electives: | |
|---|---|
| Home Econ. 125—Introduction to Foods | 3 |
| Home Econ. 161—Family Housing | 3 |
| Home Econ. 162—The Home and Its Furnishings | 3 |
| Home Econ. 190—Clothing Selection | 3 |
| Home Econ. 201—The Child and His Development | 3 |
| Home Econ. 202—Laboratory in Child Development | 2 |
| Home Econ. 285—History of Costume | 2 |
| Home Econ. 395—Fashion Analysis | 3 |

## Minor in Teacher Training in Journalism for Non-Journalism Majors

The teaching minor in the field of journalism requires a minimum of eighteen hours in journalism including the following courses:

HOUR

Required Courses:

Journ. 204—Typography
Journ. 211—Reporting
Journ. 212—Reporting Practice
Journ. 281—Introduction to Advertising
Journ. 308—High School Journalism
Journ. 321—Copyreading

Recommended Courses for Additional Credit:

Journ. 215 and 216—Contemporary Affairs 2 to 4
Journ. 218—The Press and Public Opinion
Journ. 223—Press Photography
Journ. 227—Magazine Article Writing
Journ. 261—Principles of Radio and Television Broadcasting

Altgeld Hall for law students.

# College of Law

The primary purpose of the College of Law is to train men and women for the practice of law. Training for this purpose has proved its value also for those who become judges, legislators, and teachers of law and for administrators in government and in private business. The college aims to maintain a program which will prepare men and women for any of these callings, and which will assist them in becoming leaders in public thought and in community service.

The college conceives its responsibility as embracing much more than the learning of legal rules and formulas. It seeks to guide students in discriminating among the diverse sources of law, in appreciating the function of law in the social order, and in aiding the law to keep pace with changing conditions. It endeavors to inspire a consciousness of the lawyer's responsibility for the rational development and improvement of law in its substance and its administration.

Instruction in the College of Law is conducted by a faculty, all of whom have had substantial experience in private practice, government service, bar association activities, or a combination of these. They include authors of the nation's leading law textbooks, treatises, and casebooks, as well as numerous law review articles.

Most classes are conducted by the "case method." Broadly conceived, the case method involves the study of judicial decisions, statutes, and other sources of law, and the discussion and critical analysis of these materials by students under the guidance of members of the teaching staff. In advanced classes, increasing use is being made of exercises in drafting and research, and of seminars in which students may lead as well as follow in the discussion.

Courses are offered in wide variety. Beginning courses, dealing with basic problems in contract, tort, crime, and procedure, are required of all students. Intermediate and advanced courses are generally optional. Essential fields of practice, typified by trusts, evidence, and corporations, are thoroughly covered, and, in addition, students are offered a wide choice of specialized courses such as those in municipal corporations, oil and gas, and insurance.

#### REQUIREMENTS FOR ADMISSION

All applicants for admission must have attained, as a condition to regular enrollment, senior standing in a college of the University of Illinois or a college approved by the University, and have achieved a grade average of 3.5 in all college work taken.

Applicants are advised to take the Law School Admission Test. This test is given four times a year at various centers in the United States, including the Student Counseling Bureau of the University of Illinois. The score secured on this test affords valuable

evidence on the applicant's aptitude for law study and is a basis for counseling him as to his plans. Information on the test may be obtained by writing to the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

Applicants must file requests for admission on forms furnished by the College, not less than sixty days before the opening of the term to which admission is sought. Applicants who are in the last semester of prelegal college work may submit for preliminary evaluation transcripts of all work completed at the time of application.

**Transfers from Other Law Schools.** Students from law schools of approved standing who comply with the requirements for admission to this college may by transfer receive credit up to but not exceeding two years. The amount of credit given for work taken in another school depends upon the standards of the school and the grades the student has received.

## PRELEGAL COURSE

Students contemplating the study of law are advised to consult with the Student Counseling Bureau of the University relative to their interests and aptitudes for law, and with members of the law faculty in regard to their plans. The prelegal courses they take constitute a highly important phase of their education and should be planned with care.

Students taking the curriculum leading toward degrees in both liberal arts and law or commerce and law, or agriculture and law, should comply with the major and minor and other requirements of the college in which their prelegal work is taken. Such students are urged to complete all of these requirements before entering the College of Law in order that they may devote their entire time to the first year of the law curriculum.

The prospective law student is advised to choose his work, beyond those subjects prescribed in the college in which he is registered, from among the following fields: English, with special emphasis on rhetoric and speech; political science; history, with emphasis on American and English constitutional history; economics; philosophy and particularly logic; Latin; psychology; sociology; mathematics; and accountancy.

It is essential that all students preparing for the study of law include accounting in their prelegal programs. They are advised also to include courses in the social sciences and students carrying majors in other fields should take as much work as possible in the social sciences. Attention is also called to the fact that engineering and law, agriculture and law, and chemistry and law are very good combinations in the preparation they give for special fields of practice.

## REQUIREMENTS FOR GRADUATION

The degree of Bachelor of Laws is conferred on students who study law for a minimum period of six semesters and one eight-week summer term and obtain ninety-two hours of law credit with a weighted average grade of at least 3.0 in credits obtained in law courses taken in this University.

In order to count resident study in full satisfaction of the time requirement, a student must carry courses aggregating not less than ten hours a week each semester. Proportional credit toward the time requirement is awarded to students carrying less than ten hours a week.

## HONORS AT GRADUATION

A student who has complied with the requirements for the degree and who has attained in all work done in courses offered in the College of Law and presented for the degree the average grade specified below may be recommended for honors as follows: For an average grade of not less than 4.35, graduation with Honors; for an average grade of not less than 4.75, graduation with High Honors. The honors conferred shall be noted upon the diploma and the commencement program.

**REQUIRED COURSES**

| IRST YEAR FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| aw 301—Contracts A | 3 | Law 302—Contracts B | 3 |
| aw 303—Torts A | 3 | Law 304—Torts B | 3 |
| aw 305—Judicial Remedies | 4 | Law 306—Agency and Employment | 3 |
| aw 309—Criminal Law | 3 | Law 308—Estates in Land | 2 |
| aw 315—Legal Writing A | 2 | Law 310—Constitutional Law | 3 |
| | | Law 316—Legal Writing B | 1 |

**ADVANCED COURSES (Optional)**

After his first year, the student is permitted a choice of courses. In making his selection of courses in his second year, however, he should aim to lay a proper foundation for more advanced fields of study. To that end he will ordinarily elect in that year such courses as trusts, pleading, evidence, property (including titles and vendor and purchaser), business associations, administrative law, wills, bills and notes, and federal taxation.

Liberal Arts and Sciences classrooms and offices are located in Lincoln Hall.

# College of Liberal Arts and Sciences

The College of Liberal Arts and Sciences serves several major purposes. It is the bearer of the old tradition of liberal education; it is a service unit for other colleges offering fixed curricula in preprofessional training; and it offers a number of programs leading to professional degrees.

**The General Curriculum.** The general curriculum in Liberal Arts and Sciences (page 166) requires a nucleus of courses in humanities, social sciences, biological sciences, and physical sciences; a reading knowledge of at least one foreign language; and a certain amount of concentration in the subjects chosen as majors and minors. Students in this curriculum are encouraged to develop interests and talents supplementing their major subjects and to take courses with cultural values such as art, literature, music, and others listed as electives.

All students planning for more advanced study after graduation, especially if they hope to engage in research, are encouraged to arrange their programs with reference to the requirements for admission to the Graduate College. Provision has been made for those who wish to prepare themselves for various professions and vocations.

**Division of General Studies.** The Division of General Studies provides a unified two-year program of basic courses. The primary aim is a liberal education to insure a well-balanced personal development with an understanding of the forces, tendencies, and conflicts of the present age in the light of the intellectual and cultural heritage of the past. (See page 165.)

**Chemistry and Chemical Engineering.** Chemistry may be taken as a major subject in the general curriculum, as a minor subject, or as an elective independent of the major and minor subjects. For more specialized training, however, separate curricula are offered in chemistry and in chemical engineering (page 176), the latter requiring certain fundamental courses in several departments of the College of Engineering.

**Home Economics.** Students desiring to specialize in home economics may make it their major subject in the general curriculum of this college as an alternative to the curricula in home economics offered by the College of Agriculture (page 64) and the College of Education (page 92). Certain courses in home economics may be elected by students not specializing in that subject.

**American Civilization, International Affairs, Latin-American Studies, and Medieval Civilization.** These curricula are cooperative interdepartmental programs. They may be used as interdepartmental majors or minors as shown in the curriculum descriptions. (See page 173.)

**Occupational Therapy.** The occupational therapy curriculum consists

of six semesters of work on the Urbana campus and five terms at the College of Medicine on the Chicago campus. Upon satisfactory completion of the work of this curriculum, the student is eligible for the degree of Bachelor of Science in Occupational Therapy from the College of Medicine. Students who wish to have the benefit of a more liberal education than is afforded by the minimum requirements in this curriculum may complete the work for a bachelor's degree in the College of Liberal Arts and Sciences before making application for admission to the professional work at the College of Medicine. For the six-semester curriculum on the Urbana campus, see page 184.

**Predentistry.** The minimum requirements for admission to the College of Dentistry may be met by students who complete two years of work identical with the first two years of the premedical curriculum (page 180). Students planning to study dentistry may register as predental freshmen and sophomores with special advisers, or may follow the general curriculum of liberal arts and sciences for more than two years in order to obtain both the necessary basic courses in the natural sciences and some courses in the humanities.

**Prejournalism.** Students preparing for journalism as a profession are advised to take two years of work in the general curriculum of liberal arts and sciences or the curriculum of the Division of General Studies, selecting fundamental courses which will admit them to the School of Journalism and Communications (page 150).

**Prelaw.** Students preparing for the study of law ordinarily complete the first three years of the general curriculum in liberal arts and sciences or the program of the Division of General Studies before entering the College of Law (page 157). During their senior year they may, if scholastically qualified, elect courses equivalent to the first year of work in that college and thus complete the requirements for graduation from this college while making progress toward a degree in law.

**Premedicine.** Students intending to study medicine may first complete the four-year general curriculum in liberal arts and sciences, with major and minor subjects chosen from the physical and biological sciences, and thus have the benefit of a more liberal education than is afforded by the minimum requirements for admission to the College of Medicine. Those who wish to enter the College of Medicine after three years of undergraduate work may enroll, if scholastically qualified, in the premedical curriculum outlined on page 180.

**Prenursing.** The prenursing curriculum is a two-year program designed to prepare students for a degree program in nursing at one of the four affiliated hospitals in Chicago. It consists of a minimum of sixty semester hours of required and elective subjects. (See page 181).

**Preveterinary.** The preveterinary curriculum is a two-year program designed to prepare students for admission to the College of Veterinary Medicine. It consists of a minimum of sixty semester hours of required and elective subjects. (See page 183.)

**Teacher Training.** Prospective teachers who are registered in the College of Liberal Arts and Sciences should register in one of the teacher-training curricula and indicate their choice of teaching field so that they may have their study program approved by one of the special advisers in the chosen field. Satisfactory completion of one of these curricula meets in full the course requirements of the state law for certification of teachers.

**Individual Curricula and Tutorial Work.** For superior students who have had at least one year of undergraduate work in residence at the University, individual curricula may be arranged to serve other purposes than those accomplished by the established curricula. Opportunities for independent study under the guidance of faculty members, supplementing the classroom instruction, are available under the tutorial system (page 164).

**Transfers.** Students transferring from other colleges are welcomed if they give satisfactory evidence of their ability to succeed in this college. Students in this college are free to transfer at any time to other colleges, or from one curriculum to another within this college, if they are properly qualified.

## DEPARTMENTS AND DIVISIONS

To correlate the work of the departments in the College of Liberal Arts and Sciences, the following groups are organized:

1. The Division of Biological Sciences, consisting of Bacteriology, Botany, Entomology, Physiology, Psychology, and Zoology.
2. The Division of Humanities, consisting of the Classics, English (including Rhetoric), French, German, Philosophy, Spanish and Italian (including Portuguese), and Speech.
3. The Division of Social Sciences, consisting of Economics (a department in the College of Commerce and Business Administration), Geography, History, Philosophy, Political Science, Psychology, and Sociology and Anthropology.
4. The departments of the physical sciences are Astronomy, Chemistry (including Chemical Engineering), Geology, and Mathematics.

Graduate as well as undergraduate work is conducted in all departments of this college, and courses in all these departments are taken by students enrolled in other colleges and schools of the University. The work of the faculty of this college thus serves all curricula that include the humanities, natural sciences, and social sciences.

## INDIVIDUAL CURRICULA

A limited number of sufficiently gifted and mature students may make arrangements for individual curricula, the satisfactory completion of which will lead to the degree of Bachelor of Arts or Bachelor of Science. The main purpose of such curricula is to serve the needs of superior students who can profit more from individual programs of studies than from any of the established programs. In general, the following regulations govern the operation of individual curricula.

1. A student may make application to the Dean of the College for admission to an individual curriculum after the completion of at least twenty-seven semester hours in residence at the University with an average of at least 4.0.
2. The acceptance of a student for registration in an individual curriculum requires the approval of the college and of the major department concerned.
3. Each candidate must meet the general University requirements with reference to registration, residence, fees, hygiene, military training, physical education, and rhetoric, and obtain credit in approved courses totaling at least 120 semester hours.
4. Having once been admitted to an individual curriculum, a student must maintain an average grade of at least 3.5, or be transferred to one of the established curricula.

## TUTORIAL WORK

Under the tutorial system, students in the College of Liberal Arts and Sciences have opportunities for independent study and investigation. Before beginning tutorial work, a student must ordinarily have completed the prescribed subjects and general education sequences (see pages 166-168) for the general curriculum or the freshman-sophomore program of the Division of General Studies; have attained junior standing with at least a 4.0 academic average in work taken at the University (exclusive of courses in military and physical education); and have given promise of being able to do independent work in the proposed field of investigation. Applications are subject to approval by the department concerned and by the Dean of the College, and should ordinarily be filed before the close of the sophomore year. In the case of departments in which required sequential courses extend through the junior year, applications may be deferred until the beginning of the senior year.

Students whose applications are accepted will register for tutorial work. Such students should normally register for sixteen hours of credit in any one semester, of which not more than twelve hours may be in formal class work. However, it is permissible to leave undetermined the number of hours of credit in tutorial work until the close of the semester. In such cases, the amount of credit is determined by the Dean on recommendation of the tutor and the department concerned.

## HONORS AT GRADUATION

At graduation, honors are awarded to students on the basis of superior quality of scholarship.

A student is considered eligible for graduation with honors who, after having attained junior or higher standing, has earned fifty-six or more semester hours in the University which count toward graduation from this college, and who has fulfilled all other graduation and honors conditions.

While earning credit to be presented for honors, a student must carry at least twelve semester hours of academic work (exclusive of military, physical education, or hygiene) each semester.

Honors are awarded and graded according to the following rules:

1. All candidates for honors must present an acceptable thesis or pass a comprehensive examination based on a course of study approved by the department of specialization or another competent body. The thesis course or special course of study must carry credit for not less than four semester hours. It is recommended that the student spend two semesters on the thesis or honors course, taking it for at least two semester hours of credit each semester.

2. For the degree with Honors, the student must be recommended for Honors by his department of specialization, and have earned an average of 4.0 in all courses counted toward graduation from this college.

3. For the degree with High Honors, a student must be recommended for High Honors by his department, and have earned an average of 4.25 in all courses counted toward graduation from this college. The thesis or comprehensive examination must give evidence of unusual ability.

4. For the degree with Highest Honors, a student must be recommended for Highest Honors by his department, and have earned an average of 4.5 in all courses counted toward graduation from this college. The thesis or comprehensive examination must give evidence of exceptional ability.

For graduation with honors, the notation on the diploma reads: Honors in .....; High Honors in .....; Highest Honors in ..... (The name of the student's subject or subjects of specialization is added). Such honors are recommended by the head of the department of specialization and are subject to the approval of the Dean of the College.

**Honors in Tutorial Work.** The honors to be awarded at graduation to superior students upon completion of their tutorial work are designated as Tutorial Honors, High Tutorial Honors, and Highest Tutorial Honors. They are awarded and graded solely on the basis of the general examination given at the close of the tutorial course. For graduation with honors in tutorial work, the notation on the diploma reads: Tutorial Honors in .....; High Tutorial Honors in .....; Highest Tutorial Honors in

..... (The name of the student's subjects of specialization is added.) Such honors are recommended by the head of the department of specialization and are subject to the approval of the Dean of the College.

## Curriculum in the Division of General Studies

The Division of General Studies offers a two-year program at the end of which a student may transfer his credit into other curricula of the College of Liberal Arts and Sciences or into the curricula of other colleges; or may bring his formal university career to a temporary or final close. In the latter case, if he so desires and if he has fulfilled successfully all requirements, the student will be awarded the Certificate of Associate in Arts.

### GENERAL COURSES

The work of this curriculum is based on seven general courses, one in each of the following fields: verbal communication, history of civilization, biological science, physical science, social science, literature and the fine arts, philosophy and psychology. Each course extends through two semesters and gives eight semester hours of credit toward graduation. The student receives grades and credits at the end of each semester.

In all these courses the general purpose is the introduction of the student to the points of view and methods of exploration characteristic of each field, to enable him to discover and make use of its resources for individual and social living. These courses are planned to supplement and support one another.

Each student normally completes three of these general courses in his freshman year and three more of them in his sophomore year. At least six of the seven, including the first four listed above, should be completed by the end of the sophomore year.

| FIRST YEAR FIRST SEMESTER | 14 TO 16 HOURS |
|---|---|
| D.G.S. 111—Verbal Communication | 4 |
| D.G.S. 121—History of Civilization | 4 |
| D.G.S. 131—Biological Science, or D.G.S. 141—Physical Science | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[1] | 2 to 4 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| D.G.S. 112—Verbal Communication | 4 |
| D.G.S. 122—History of Civilization | 4 |
| D.G.S. 132—Biological Science, or D.G.S. 142—Physical Science | 4 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[1] | 2 to 4 |

| SECOND YEAR | 14 TO 16 HOURS |
|---|---|
| D.G.S. 131—Biological Science, or D.G.S. 141—Physical Science | 4 |
| Two of the following: | |
| D.G.S. 151—Social Science | 4 |
| D.G.S. 161—Literature and Fine Arts | 4 |
| D.G.S. 171—General Division Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[1] | 2 to 4 |

| | 13 TO 17 HOURS |
|---|---|
| D.G.S. 132—Biological Science, or D.G.S. 142—Physical Science | 4 |
| Two of the following: | |
| D.G.S. 152—Social Science | 4 |
| D.G.S. 162—Literature and Fine Arts | 4 |
| Philosophy | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[1] | 2 to 5 |

[1] An elective is not required in a minimum schedule, but most students will wish to elect another course. A foreign language is recommended, especially for students who plan to continue in the College of Liberal Arts and Sciences for a bachelor's degree. Mathematics is also recommended, especially for students who may be going into technical work.

Students from outside the Division of General Studies may elect one or more of the seven courses and will receive full credit for each semester successfully completed.

#### TRANSFERRING TO OTHER CURRICULA

If at the end of the second year in the Division of General Studies a student transfers to the general curriculum in the College of Liberal Arts and Sciences, he must satisfy the foreign language requirement of the college (see page 167) to obtain his degree. If he has successfully completed six of the seven courses in the Division, he will have fulfilled the new general education requirements of the college.

The two-year program of the Division of General Studies is highly recommended as a preparation for the professional curricula in the College of Law, the School of Journalism and Communications, and those curricula in the College of Education which begin in the junior year.

## General Curriculum in Liberal Arts and Sciences

### For the Certificate of Associate in Arts

Students in the liberal arts and specialized curricula who have satisfactorily met the basic knowledge and general education requirements of the liberal arts curriculum and the general University requirements in rhetoric, hygiene, military, and physical education, and who have satisfactorily completed sixty hours of academic work shall, upon application, be awarded the certificate of Associate in Arts.

### For the Degree of Bachelor of Arts or Bachelor of Science

Because of the wide range of courses open to students in the general curriculum of liberal arts and sciences, it is not feasible to specify the definite sequences of courses to be taken by any student in each of the four years of this curriculum. Under the guidance of advisers, each student is expected to plan his own program within the general requirements outlined below. This general outline indicates the ordinary procedure in fulfilling the requirements for the degree of Bachelor of Arts, or for the optional degree of Bachelor of Science.

#### REQUIREMENTS FOR GRADUATION

Each candidate for the degree of Bachelor of Arts or Bachelor of Science in the general curriculum of liberal arts and sciences must meet the general University requirements with reference to registration, residence, fees, hygiene, military, physical education, and rhetoric. He must also obtain credit, with a satisfactory scholastic average, in approved courses totaling at least 120 semester hours, not counting credit earned for the first two years of work in military and physical education. In securing this credit, each candidate must have an average of not less than 3.0 in all grades received, including grades in courses transferred from other institutions, and excluding those received in the first two years of work in physical education and military training. (The grades received in advanced military training are used in computing the average.) He must not have grades below "C" in more than one-fourth of the total number of semester hours earned. In computing the grade-point average, weighted values are given to the grades as follows: "A" = 5 grade points; "B" =4; "C" = 3; "D" = 2; "E" (failure) = 1. The individual grades are multiplied by the respective number of semester hours which each represents and the sum of these products is divided by the total number of semester hours taken.

**Optional Degree of Bachelor of Science.** Majors in the physical sciences (which include mathematics) and the biological sciences, home economics, and psychology may receive the degree of Bachelor of Science. The degree desired must be indicated on the authorization card at the time of registration for the last semester of work.

#### PRESCRIBED SUBJECTS

To be begun in the first semester of the freshman year, except as otherwise provided and to be continued until the requirements are completed.

1. **Hygiene.** One semester, not more than two hours. Credit may be obtained by a proficiency examination.

2. **Physical Education.** Four semesters.

3. **Military (men).** Four semesters.

4. **Rhetoric.** Two semesters (Rhet. 101 and 102). The quality of work acceptable in the fulfillment of this requirement must satisfy the general University regulations concerning rhetoric which are found on page 26. This requirement may be satisfied by foreign students if they pass Rhet. 114 and 115.

5. **Foreign Language.** A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, Russian, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104 or 105, Portuguese 104, Russian 204, Spanish 104, or a more advanced course in any of these languages. Completion of four years of one of these languages in high school also satisfies this requirement. Proficiency examinations are offered in all these courses as well as in the more elementary courses in languages.

NOTE: No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. (Students planning to enter the Graduate College are advised to obtain a reading knowledge of both French and German.)

6. **Basic Knowledge.** Students who enter the general curriculum in liberal arts and sciences as freshmen (or who enter other schools and subsequently transfer to the college) and who lack one unit of American history in high school must take Hist. 151 and 152; and those who lack two units of high school credit in mathematics—one unit in algebra and one unit in plane geometry—must take Math. 101 and 102.

## GENERAL EDUCATION SEQUENCES

Students who enter the general curriculum (or who enter other schools and subsequently transfer to the college) are required to complete at least one approved sequence in each of these areas: (a) humanities, (b) biological science, (c) physical science, and (d) social science.

The following regulations apply to the foregoing sequences:

1. Students should complete at least one of these sequences during the first year of study.

2. Students with sophomore standing should complete at least one additional sequence during the second year.

3. Some of the sequences are at the advanced level and require at least junior standing. Such courses will count toward advanced hours required for graduation.

4. A student need not satisfy a sequence in the area in which the major department is classified. For example, if the major is chemistry, the student does not take a general education sequence in the physical sciences. If the major is English, then no other sequence is required in the humanities. The same is true for other areas. Consequently, freshmen should enroll in a sequence which will not duplicate the intended major, and final decision on the major field should be made at the beginning of the sophomore year if possible.

5. In so far as possible, the sequences should be chosen from courses approved by the college. Authority for substitutions in the sequence requirements must be obtained from one of the deans. The following have been approved:

**Biological Science**

Bact. 104, 310
Bot. 100, Zool. 104
Bot. 100, Zool. 351
D.G.S. 131, 132
Entom. 103, Bot. 100
Entom. 103, Zool. 104
Entom. 103, Zool. 351
Physiol. 103, Psych. 103
Physiol. 103, Zool. 351
Zool. 104, 351

**Humanities**

Classics 301, 302
D.G.S. 161, 162
Engl. 101, 102, 103
Engl. 121, 122
Engl. 363, 364
Hist. 161, 162
Hist. 323, 324
Humanities 211, 212
Phil. 101, 102, 105
Phil. 303, 306

**Physical Science**

An approved sequence of eight hours chosen from chemistry, mathematics, or physics
Astron. 201, 202
D.G.S. 141, 142
Geog. 101, 111
Geol. 101, 102

**Social Science**

D.G.S. 121, 122
D.G.S. 151, 152
Econ. 108, 210
Econ. 108, 218
Geog. 101, 104
Hist. 111, 112
Phil. 103, 104
Pol. Sci. 101, 102
Pol. Sci. 345, 336
Psych. 105, 106
Soctol. 100, 243
Sociol. 104, 105

A student may not use more than one sequence from any one department to satisf the general education requirements.

A student may not use more than one six- or seven-hour sequence to satisfy th general education requirements.

NOTE: Any student who has completed the six courses prescribed by the Divisio of General Studies will have satisfied all of the general education sequence requiremen in the general curriculum.

## MAJORS, MINORS, AND ADVANCED COURSES

1. **Major Subjects.** Each student before beginning the junior year selects one subje and declares it to be his major. In order to be acceptable for graduation, a major mu consist of at least twenty hours in courses chosen from those designated by a departmer and approved by the faculty of the college. Such courses are to be inclusive of some di tinctly advanced work and exclusive of courses open to freshmen. At least five hours the work acceptable for a major must be done in residence at the University.

The subjects recognized as majors in this college are: bacteriology, botany, chemistr classics, economics, English, entomology, French, geography, geology, German, Gree history, history of art, home economics, Italian, Latin, mathematics, music, philosoph physics, physiology, political science, psychology, sociology and anthropology, Spanis speech, zoology.

2. **Minor Subjects.** Each candidate for graduation must offer, in addition to h major, a minor consisting of twenty hours in one or two subjects designated by the d partment in which he is taking his major and approved by the faculty, with at least eig hours in each subject is two are chosen.

3. **Interdepartmental Majors and Minors.** The curricula in American civilizatio international affairs, Latin-American studies, and medieval civilization may be used majors, or as minors with a major in certain departments. The details of these curricu and the departments with which they may be used as majors or as minors are show on pages 173-175.

4. **Advanced Courses.** Thirty hours of the work taken in the junior and senior yea must be in courses not ordinarily open to freshmen or sophomores. Students should pla their first and second years of work so as to include the prerequisites for advanced course (Advanced courses are numbered 200 or 300 with the exception of Rhet. 200.)

## ELECTIVES

1. **Liberal Arts and Sciences.** Any course offered in the College of Liberal Arts an Sciences may be used as an elective.

2. **Other Colleges.** Electives totaling as much as but not more than thirty-two hou may be taken in other colleges and schools of the University and counted toward gradu

ion from this college, in addition to the courses acceptable for major and minor requirements, if such electives are in conformity with the following list approved by the faculty:

**Accountancy.** A total of 6 hours including not more than one of the following courses: Accy. 101, 102, or 201.

**Agricultural Economics.** A total of 6 hours.

**Architecture.** A total of 15 hours.

**Art.** A total of 15 hours, unless the student is majoring in history of art.

**Aviation.** A total of 3 hours.

**Business Law.** A total of 6 hours.

**Economics.** All courses.

**Education.** A total of 20 hours.

**Engineering.** A total of 10 hours.

**Food Technology.** A total of 6 hours.

**Forestry.** A total of 3 hours.

**Home Economics.** All courses.

**Horticulture.** A total of 6 hours.

**Hygiene.** Hygiene 101 or 104 (2 hours).

**Journalism.** A total of 10 hours.

**Landscape Architecture.** A total of 7 hours.

**Law.** A student of senior standing with an average of 3.5 who has been in residence either the first two years or the last year of his prelegal work may take and count toward the A.B. degree not more than 32 hours in the College of Law, provided that not less than two courses amounting to at least 5 hours a semester are taken, with the advice of the Dean of the College of Law, and provided further that if any such student desires to take more than 6 hours of law work he must also register in the College of Law.

**Library Science.** A total of 20 hours.

**Management and Marketing.** A total of 6 hours. Typewriting, secretarial training, and shorthand may not be counted for credit.

**Military.** A total of 8 hours in advanced courses.

**Music.** A total of 15 hours approved by the Director of the School, unless the student is majoring in music.

**Physics.** All courses.

**Religious Foundation Courses.** A total of 10 hours. Not open to freshmen or to students on probation.

**Social Work.** May be used as a minor with approval of the major department.

**Graduate Courses.** A student of excellent standing who is within 5 semester hours of his bachelor's degree may be given the privilege of electing courses in the Graduate College with the consent of the Dean of that College. Such a student will register in both the College of Liberal Arts and Sciences and the Graduate College.

## MAJORS OUTSIDE THE COLLEGE

### . Economics

**Major:** In addition to Econ. 102 and 103, or Econ. 108 and 109, twenty hours of ourses in economics for which Econ. 102 or 108 is a prerequisite, including Econ. 300 nd two other courses chosen from the following: 210, 214, 215, 216, 218, 224, 228, 238, 39, 240, 246, 248, 250, 254, 257, 260, 262, 272, 280, 288, 290, 291, 292, 293, 301, 306, 12, 326, 328, 336 (the prerequisite of Econ. 102 or 108 is waived for this course), 342, 78, 380, 384, 388, 389, 390, 391.

L.A.S. majors in economics are advised strongly to elect Econ. 170 or 171 and Accy. 01. Econ. 170 or 171 is acceptable toward the twenty-hour major but Accy. 201 is not cceptable toward the major requirement.

**Minors:** Twenty hours in any one or two of the following subjects: geography, geology, history, mathematics, philosophy, political science, psychology, social work, sociology nd anthropology. At least eight hours must be taken in each subject, if two are chosen. he curriculum in international affairs will be accepted as a minor, and also the program n Latin-American studies.

### . History of Art

**Major:** Twenty hours in art, excluding Art 185 and 186. The major must include rt 111, 112, 188, and 189, and at least ten hours chosen from Art 311, 312, 313, 314, 15, 316, 317, 318.

**Minor:** Twenty hours in any one or two of the subjects which follow: English, Greek, istory, Latin, philosophy, psychology, sociology and anthropology, and speech. At least ight hours must be taken in each subject if two are chosen. The minor may also be

taken in the curriculum in medieval civilization or the curriculum in Latin-American studies.

### 3. Home Economics

This curriculum is given in detail in the section on Programs Designed Primarily for Women (page 172).

### 4. Music

**Major:** Thirty-two hours in music, including the following: Music 102, 103, 106, 107, 226, and 227; two hours of Music 246; four hours of applied music (Music 160-177); six hours of electives in advanced music history. Students unable to pass the qualifying examination required for registration in Music 102 must take Music 100 in excess of graduation requirements.

The qualifying examination in piano given at the time of entrance, presumes a moderate degree of proficiency (scales, simple composition, and sight reading, together with an adequate keyboard technique). Students unable to meet this proficiency must satisfy this requirement in excess of curriculum requirements in applied music.

**Minor:** Twenty hours in one or two subjects chosen from the following list: history, languages, language and literature, philosophy, physics, physiology, psychology, sociology and anthropology. At least eight hours must be taken in each subject if two are chosen.

## PROGRAMS DESIGNED PRIMARILY FOR WOMEN

### 1. Minor in Family and Community Life

Advisers for this program are Mrs. Leah F. Trelease, Associate Professor of English, and the Deans of the College.

**Minor:** Twenty hours chosen from the following groups of courses in family and community life, including:

| | HOUR |
|---|---|
| Home Econ. 201—The Child and His Development, or Psych. 216—Child Psychology | |
| Home Econ. 210—Family Relationships, or Sociol. 220—Marriage and the Family | |
| Home Econ. 271—Home Management | |
| Total | |

No course in the student's major field may be included in this minor.

#### Biological Area

| | HOUR |
|---|---|
| Bot. 100—General Botany[1] | |
| D.G.S. 131-132—Biological Science[1] | |
| Home Econ. 120—Elementary Nutrition[2] | |
| Home Econ. 228—Hygiene and Home Care of Sick | |
| Physiol. 103—Introduction to Human Physiology[1] | |
| Psych. 103—Human Behavior[1, 3] | |
| Zool. 104—Zoology-Botany Sequence[1] | |

#### Psychological Area

| | |
|---|---|
| D.G.S. 171—Psychology[2] | |
| Home Econ. 201—The Child and His Development[3] | |

[1] Courses which satisfy all or part of the general education sequence requirement.
[2] Courses normally requiring sophomore standing.
[3] Courses having a specific course prerequisite.

| | |
|---|---|
| Home Econ. 210—Family Relationships | 3 |
| Psych. 105-106—Human Nature[1, 3] | 8 |
| Psych. 150—Personality and Social Behavior[3] | 3 |
| Psych. 183—Psychology of Adjustment[3] | 3 |
| Psych. 216—Child Psychology[3] | 3 |
| Psych. 250—Psychology of Personality[3] | 3 |
| Psych. 255—Social Psychology[3] | 3 |
| Psych. 326—Motivation and Emotion[3] | 3 |

## Economic Area

| | |
|---|---|
| Bus. Law 261—Summary of Business Law | 3 |
| D.G.S. 151-152—Social Science[1, 2] | 8 |
| Econ. 378—Consumers and the Market | 3 |
| Econ. 380—Economic Problems of the Family | 3 |
| Home Econ. 125—Introduction to Foods[2] | 3 |
| Home Econ. 161—Family Housing[2] | 3 |
| Home Econ. 271—Home Management | 3 |
| Home Econ. 361—Development and Function of Family Housing[3] | 3 |

## Government and History Area

| | |
|---|---|
| Hist. 111-112—Modern European History[1] | 8 |
| Hist. 151-152—History of the United States[2] | 6 |
| Journ. 215-216—Contemporary Affairs | 4 |
| Pol. Sci. 110—Government in Illinois[2] | 2 |
| Pol. Sci. 150-151—American Government[2] | 8 |
| Pol. Sci. 305-306—Municipal Government | 6 |
| Pol. Sci. 310—Rural Local Government | 3 |
| Pol. Sci. 315—Legislatures and Legislation[3] | 3 |
| Pol. Sci. 371-372—International Organization | 6 |
| Pol. Sci. 381—American Foreign Relations[3] | 2 |
| Pol. Sci. 382—Contemporary American Foreign Policies[3] | 3 |
| Pol. Sci. 384—International Relations | 3 |
| Soc. Sci. 112—The Bases of American Life | 4 |
| Soc. Sci. 113—World Patterns and Problems | 4 |

## Sociological Area

| | |
|---|---|
| Phil. 103—Ethics and Social Policy[1, 2] | 4 |
| Phil. 104—Philosophy of Democracy[1, 2] | 4 |
| Soc. Sci. 111—The Individual in Society | 4 |
| Sociol. 104-105—Community and Society[1] | 8 |
| Sociol. 220—Marriage and the Family[3] | 3 |
| Sociol. 225—Racial and Cultural Minorities[3] | 3 |
| Sociol. 230—Poverty and Society[3] | 3 |
| Sociol. 243—Social Evolution[3] | 3 |
| Sociol. 276—Sociology of the City[3] | 3 |
| Sociol. 277—Rural Sociology | 3 |
| Sociol. 332—Prevention and Treatment of Juvenile Delinquency[3] | 3 |

[1] Courses which satisfy all or part of the general education sequence requirement.
[2] Courses normally requiring sophomore standing.
[3] Courses having a specific course prerequisite.

## Cultural and Recreational Area

| | |
|---|---|
| Art 170—Recreational Crafts[1] | 2 |
| Classics 101—Mythology of Greece and Rome[2] | 2 |
| D.G.S. 161-162—Literature and Fine Arts[1, 2] | 8 |
| Engl. 121-122—Chief English Writers[1, 2] | 8 |
| Engl. 131 or 231—Shakespeare[1] | 3 |
| Hist. 131-132—History of England | 6 |
| Hist. 161-162—Survey of American Civilization[1, 2] | 8 |
| Hist. 371-372—American Intellectual and Cultural History[3] | 6 |
| Home Econ. 162—The Home and Its Furnishings[3] | 3 |
| Home Econ. 180—Selection and Care of Textiles | 2 or 3 |
| Home Econ. 182—Clothing Laboratory[3] | 2 |
| Home Econ. 190—Clothing Selection[1] | 3 |
| Humanities 211-212—The Growth of American Culture[2] | 8 |
| P.E.W. 166—Games for Children | 2 |
| Any advanced courses in foreign literature[1] | 3 |

## 2. Curriculum for Majors in Home Economics

| University Requirements | HOURS |
|---|---|
| Rhet. 101-102—Rhetoric and Composition | 6 |
| Hygiene 101—Health Lectures, or Hygiene 104—Personal and Community Hygiene | 2 |
| **Liberal Arts and Sciences Requirements** | |
| Language | 16 |
| Biological Sciences | 9 |
| Bact. 104—Elementary Bacteriology | |
| Physiol. 103—Introduction to Human Physiology | |
| Physical Sciences | 8 |
| Chem. 102—General Chemistry | |
| Chem. 132—Elementary Organic Chemistry | |
| Social Sciences | 10 |
| Econ. 108—Elements of Economics | |
| Psych. 100—Introduction to Psychology | |
| Sociol. 100—Principles of Sociology | |
| Humanities | 6 or 8 |
| Engl. 121-122—Chief English Writers, or | |
| Engl. 363-364—Introduction to Comparative Literature, or | |
| Humanities 211-212—The Growth of American Culture | |
| Home Economics Major | 29 |
| Minor | 13 or 20 |
| If chemistry and bacteriology, or economics, psychology, and sociology as listed by Home Economics, 13 hours; otherwise 20 hours. | |
| Art 185—Design | 2 |
| Electives | 17 or 19 |
| Total | 120 |

## 3. Minor in Home Economics

| | HOURS |
|---|---|
| Required Courses | 6 |
| Home Econ. 201—The Child and His Development | |
| Home Econ. 210—Family Relationships | |
| Additional courses to be chosen from the following areas (a minimum of five hours must be chosen from each of two areas) | 14 |

[1] Courses normally requiring sophomore standing.
[2] Courses which satisfy all or part of the general education sequence requirement.
[3] Courses having a specific course prerequisite.

### Foods and Nutrition

Home Econ. 120—Elementary Nutrition[1] . . . . . 2
Home Econ. 125—Introduction to Foods[1] . . . . . 3
Home Econ. 130—Introduction to Foods and Nutrition[1] . . . . . 2
Home Econ. 131—Foods . . . . . 3
Home Econ. 232—Food Economics and Meal Management . . . . . 3

### Home Management, Housing, and Home Furnishings

Home Econ. 161—Family Housing . . . . . 3
Home Econ. 162—The Home and Its Furnishings . . . . . 3
Home Econ. 262—The Home and Its Furnishings . . . . . 3
Home Econ. 271—Home Management[2] . . . . . 2
Home Econ. 272—Organization and Management of the Home[2] . . . . . 3

### Textiles and Clothing

Home Econ. 180—Selection and Care of Textiles . . . . . 3
Home Econ. 182—Clothing Construction . . . . . 2
Home Econ. 185—Clothing . . . . . 2
Home Econ. 186—Costume Design . . . . . 2
Home Econ. 190—Clothing Selection . . . . . 3

## INTERDEPARTMENTAL PROGRAMS

### Curriculum in American Civilization

This curriculum is sponsored by the Division of Humanities.

**I. For Students Majoring in American Civilization**

**Major:** Students who elect American civilization as a major shall complete forty semester hours (which satisfies both major and minor requirements for graduation) in courses indicated below, at least twenty hours being in courses numbered 300 or above. They are required to maintain a 3.0 general average at all times; that is, when the average drops below that level the student shall drop from this major. Specifically required are:

1. Engl. 113, 114, Hist. 151, 152, and either Art 317 or Phil. 313 (a total of fifteen hours). Equivalent or more advanced courses may be substituted provided that, taken together, they constitute comprehensive surveys of the three fields of American history, American literature, and either American art or American philosophy. Approval for any such substitution must be requested by a petition to the Dean bearing the recommendation of the adviser for the curriculum.

2. At least six hours of advanced work in history and at least six hours of advanced work in English, chosen from the following courses all of which are in the American field: Engl. 144, 285, 286, 315, 316, 318, 352, 353, 354, 375; Hist. 335, 336, 352, 354, 357, 358, 359, 361, 362, 363, 364, 369, 370, 371, 372, 373, 374. Speech 366 may be substituted for Engl. 315, 316.

3. At least six hours from the following courses: Arch. 215, 216; Econ. 336; Ed. 302; Geog. 221, 222; Pol. Sci. 150, 151, 351, 381, 397; Speech 312; or courses listed in the preceding paragraphs, if not counted toward the requirements thereunder.

4. At least six additional hours in one of the following departments: Art, English, History, Philosophy, or Political Science, chosen from courses which deal with non-American aspects of the subject but which are closely related to specific courses selected under the preceding requirements, such as, for example, a course dealing with the same period in European history or in English literature. The committee in charge of the curriculum will advise each student concerning these additional hours, will assume

[1] Credit is not given in Home Econ. 130 in addition to Home Econ. 120 and 125.
[2] Credit is not given in Home Econ. 272 in addition to Home Econ. 271.

responsibility for the student's registration in the proper courses, and will file a record of the student's registration indicating the specific courses approved as satisfying this paragraph in the office of the College of Liberal Arts and Sciences.

**II. For Students Whose Minor Is American Civilization**

This curriculum has been approved as a minor for students majoring in geography, history, political science, and speech. A split minor is not authorized. No course counted toward the student's major may be counted toward the minor. The minor consists of at least twenty semester hours, including the required courses Hist. 151-152 and Engl. 113-114, and in addition:

1. At least three hours from courses listed under (2) of the requirements for the major in American civilization, excluding those numbered under 300 and excluding those in the department in which the student is majoring.

2. The remainder, if any, chosen from courses listed under (1) and (3) of the requirements for the major in American civilization, excluding those numbered under 300 and excluding those in the department in which the student is majoring.

## Curriculum in International Affairs

This curriculum is sponsored by the Division of Social Sciences.

**1. For Student Majoring in International Affairs**

**Major:** Students who elect international affairs as a major shall complete forty semester hours (which satisfies both major and minor requirements for graduation) including:

1. The following prescribed courses: Econ. 326, Geog. 104, Hist. 112, Phil. 311 or 336, Pol. Sci. 371, Soc. Sci. 282, Sociol. 327, and if the student becomes a candidate for honors, Soc. Sci. 292.

2. The remaining courses from not less than two departments with at least nine hours in some one department over and above the prescribed courses chosen from the following:

Agr. Econ. 111, 201
Econ. 210, 218, 228, 239, 250, 251, 326, 346
Ed. 303
Geog. 101, 104, 231, 232, 342, 351, 363, 365
Hist. 313, 314, 317, 318, 339, 340, 376, 377, 378, 391, 392
Journ. 310
Min. E. 302
Phil. 103, 104, 311, 321, 336
Pol. Sci. 331, 336, 342, 343, 371, 372, 373, 384, 385, 386, 396
Psych. 155, 383
Soc. Sci. 101, 102, 282, 292
Sociol. 100, 288, 327, 344, 347, 378

**Minor:** The forty hours of courses required in this program satisfy both major and minor requirements for graduation.

Students who elect the above major are required to maintain a 3.5 general average at all times; that is, when the average drops below that level the student shall drop from this major.

Students are strongly urged to gain a sound working knowledge of one modern foreign language. Each student is advised to take courses from the list designed to give a better understanding of an area within the general field of international affairs. For example, he may concentrate in international economic relations, international organization, regional areas, or other features of the broad field. The courses required are intended to delineate the major underlying principles of international affairs rather than to provide detailed knowledge. The latter should be gained from the selection of courses over and above the minimum list under the guidance of the adviser and administrative committee designated by the Division of Social Sciences. Finally, the student is encouraged to take courses carrying advanced credit hours.

**2. For Students Whose Minor Is International Affairs**

Students may use international affairs as a minor if the major field is economics, geography, history, philosophy, political science, or sociology and anthropology. The

minor consists of at least twenty semester hours including the required courses: Econ. 218, Pol. Sci. 371 or 372, Sociol. 327 or 347, and at least two courses in each of Groups I and II.

Group I: Econ. 210, 326; Hist. 313 (or 314), 392; Phil. 103, 104; Pol. Sci. 396.

Group II: Agr. Econ. 111, 201; Econ. 228, 238, 250; Ed. 303; Geog. 101, 104, 342, 351, 363, 365; Hist. 111, 112, 310, 318, 320, 343; Journ. 310; Min. E. 302; Phil. 311 or 336; Pol. Sci. 331, 336, 337, 381, 384, 385, or 386; Psych. 155; Soc. Sci. 101 or 102; Sociol. 270, 288, 344.

## Curriculum in Latin-American Studies

This curriculum is sponsored by the Division of Social Sciences.

### 1. For Students Majoring in Latin-American Studies

**Major:** Students who elect Latin-American studies as a major shall be required to

(1) Complete the prescribed and general education sequences required in the general curriculum.

(2) Complete six semesters or equivalent of college Spanish or Portuguese. (In the case of well-qualified students, the language requirement for this major may be modified.)

(3) Complete at least twenty-four semester hours, including Soc. Sci. 101, 102, or both; and the remaining hours chosen from four departments among the following: Agr. Econ. 111; Anthrop. 251, 361; Art 318; Biol. Sci. 100; Econ. 328; Geog. 231, 232; Hist. 322, 375, 376, 377, 378; Pol. Sci. 342, 343.

**Minor:** Students who major in Latin-American studies may elect minors as follows: twenty hours (excluding courses taken in the freshman year) in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: agricultural economics, economics, geography, history, philosophy, political science, Portuguese, social work, sociology, and Spanish.

### 2. For Students Whose Minor Is Latin-American Studies

This curriculum has been approved as a minor for students majoring in economics, geography, history, philosophy, political science, sociology, and Spanish. Students who elect Latin-American studies as a minor shall be required to

(1) Complete four semesters or equivalent of college Spanish or Portuguese.

(2) Complete at least twenty-four semester hours chosen from the approved courses as listed above and including Soc. Sci. 101, 102, or both; and courses from at least three departments in the curriculum exclusive of courses used in the major department.

**Split Minor:** Students may split the minor with other departments, but must take at least twelve semester hours from Latin-American studies, including Soc. Sci. 101 or 102, and courses from at least two departments in the curriculum, exclusive of courses which may have been used for the major.

Science and engineering students who have full curricula of their own and who can not possibly major or minor in the above curriculum may take many of the courses without formal prerequisites.

## Curriculum in Medieval Civilization

This curriculum is sponsored by the Division of Humanities.

**Major:** Student who elect medieval civilization as a major shall complete the lower division requirements of the College of Liberal Arts and Sciences, and forty semester hours (which will satisfy both major and minor requirements) including Engl. 313, 314, Hist. 301, and 302, and twenty-eight hours in courses chosen from the following list: Arch. 214, Art 312, Classics 301, 302, Engl. 311, Hist. 304, 333, 345, Italian 311, 312, Latin 104, Phil. 304, 316, Speech 361. Other courses may be substituted with the approval of the adviser, Professor J. J. Parry, 216 Gregory Hall.

# SPECIALIZED CURRICULA

## Chemistry and Chemical Engineering

The following curricula in chemistry and chemical engineering afford more specia ized training than is required of students who make chemistry their major subject in th general curriculum of liberal arts and sciences.

The minimum language requirement for graduation in these curricula is the equiva lent of two years of college work in German or French, or one year in each. A studer who has had two years of French or German in high school should study the othe language in the University. (Russian may be substituted for French.) When a studer does not offer either German or French for entrance, the second year of the languag required for graduation may be counted as an elective in the chemistry curriculum. St dents entering with two units of credit for German or French (two units in high scho being equivalent to one year in college) should complete this minimum requirement i their freshman year. Those entering with less than two units in German or French shoul complete this requirement in their sophomore year or as early as possible.

An optional four-year curriculum in chemical engineering is available for studen who are especially interested in the field of industrial fermentation, pharmaceutical, an biochemical manufacturing industries. Students who enter without adequate preparatio in chemistry, mathematics, and languages will find it difficult to complete either of th curricula in chemical engineering in four years. An optional five-year program is avai able and is recommended especially for those who plan on seeking positions in sale technical service, and administration in the chemical industry, and who wish to broade their technical training through courses in the humanities, economics, and labor an business administration. All three curricula lead to the degree of Bachelor of Science i Chemical Engineering.

Students should note that they must have a 3.5 general average for registration i these curricula after they have attained junior standing.

## Curriculum in Chemistry

For the Degree of Bachelor of Science in Chemistry

| FIRST YEAR | FIRST SEMESTER | 17 HOURS | SECOND SEMESTER | 18 HOUR |
|---|---|---|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis[1] | | 5 | Chem. 108—General Chemistry and Qualitative Analysis | |
| German or French | | 4 | German or French | |
| Math. 117—Combined Freshman Mathematics[2] | | 5 | Hygiene 101—Health Lectures | |
| Rhet. 101—Rhetoric and Composition | | 3 | Math. 127—Combined Freshman Mathematics[2] | |
| Physical Education | | 1 | Rhet. 102—Rhetoric and Composition | |
| Military (men) | | 1 | Physical Education | |
| | | | Military (men) | |

[1] All students with entrance credit in chemistry are required to take a proficiency examination befor registering for Chem. 107. Those who do not show the necessary proficiency will be placed i Chem. 101 or 102, after which they will take Chem. 106 and 110. For students without entranc credit in chemistry, the required sequence is Chem. 101, 106, and 110.

[2] For students who do not take Math. 117 and 127, the required sequence is Math. 112 (or 111) 114 (or 115), 122, 132, and 142.

| SECOND YEAR | 16 HOURS | | 15 HOURS |
|---|---|---|---|
| Chem. 124—Quantitative Analysis | 5 | Chem. 234—Organic Chemistry | 5 |
| Math. 137—Calculus | 3 | Math. 147—Calculus | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 | Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Physical Education | 1 | Physical Education | 1 |
| Military (men) | 1 | Military (men) | 1 |
| Electives[1] | 3 | Electives[1] | 2 |

| THIRD YEAR | 16 HOURS | | 16 HOURS |
|---|---|---|---|
| Chem. 240—Elementary Physical Chemistry | 3 | Chem. 294—Chemical Literature and Reference Work | 1 |
| Chem. 241—Elementary Physical Chemistry Laboratory | 1 | Chem. 342—Elementary Physical Chemistry | 3 |
| Chem. 292—Chemical Literature and Reference Work | 1 | Chem. 343—Elementary Physical Chemistry Laboratory | 1 |
| Chem. 336—Organic Chemistry | 3 | Electives[1] | 11 |
| Chem. 337—Organic Chemistry Laboratory | 2 | | |
| Econ. 108—Elements of Economics | 3 | | |
| Electives[1] | 3 | | |

| FOURTH YEAR | 16 HOURS | | 16 HOURS |
|---|---|---|---|
| Chem. 327—Special and Instrumental Methods of Analysis | 3 | Electives[1] | 16 |
| Chem. 395—History of Science with Particular Reference to Chemistry | 2 | | |
| Electives[1] | 11 | | |

## Curriculum in Chemical Engineering

For the Degree of Bachelor of Science in Chemical Engineering

| FIRST YEAR | FIRST SEMESTER | 17 HOURS | SECOND SEMESTER | 17 HOURS |
|---|---|---|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis[2] | | 5 | Chem. 108—General Chemistry and Qualitative Analysis[2] | 5 |
| G.E.D. 106—Elements of Drawing | | 3 | Math. 132—Calculus[3] | 5 |
| Hygiene 101—Health Lectures | | 2 | Physics 106—Mechanics | 4 |
| Math. 122—Analytic Geometry[3] | | 4 | Rhet. 102—Rhetoric and Composition | 3 |
| Rhet. 101—Rhetoric and Composition | | 3 | Physical Education | (1) |
| Physical Education | | (1) | Military (men) | (1) |
| Military (men) | | (1) | | |

[1] Suggested electives are: Bact. 104 or 105; Bot. 100 or 101; Engl. 121 or 122; Geol. 130 or 150; Hist. 151 or 152; Zool. 101, 107, or 132; German or French. Of the total electives for graduation, at least twelve hours should be from advanced courses in chemistry and at least ten hours from courses offered by other departments.

[2] Students without entrance credit in chemistry take the sequence Chem. 101, 106, 110, 124, etc.

[3] Students without the required entrance credits in mathematics take Math. 112 (or 111), 114 (or 115), 122, 132, and 142.

| SECOND YEAR | 16 HOURS |
|---|---|
| Chem. 124—Quantitative Analysis | 5 |
| German or French[1] | 4 |
| Math. 142—Calculus | 3 |
| Physics 107—Electricity, Magnetism, Modern Physics | 4 |
| Physical Education | (1) |
| Military (men) | (1) |

| | 17 HOURS |
|---|---|
| Chem. 240—Elementary Physical Chemistry | 3 |
| Chem. 241—Elementary Physical Chemistry Laboratory | 1 |
| German or French[1] | 4 |
| Physics 108—Heat, Sound, Light | 4 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | (1) |
| Military (men) | (1) |
| Electives[2] | 3 |

| THIRD YEAR | 16 HOURS |
|---|---|
| Ch.E. 261—Stoichiometry | 3 |
| Ch.E. 267—Measurements and Instrumentation Laboratory | 2 |
| Chem. 234—Organic Chemistry | 5 |
| Chem. 342—Elementary Physical Chemistry | 3 |
| Electives[2] | 3 |

| | 18 HOURS |
|---|---|
| Ch.E. 370—Chemical Engineering Thermodynamics | 3 |
| Ch.E. 371—Principles of Chemical Engineering | 4 |
| Ch.E. 372—Unit Operations Laboratory | 2 |
| Chem. 336—Organic Chemistry | 3 |
| Chem. 337—Organic Chemistry Laboratory | 2 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| FOURTH YEAR | 17½ HOURS |
|---|---|
| Ch.E. 266—Inspection Trip | ½ |
| Ch.E. 373—Principles of Chemical Engineering | 4 |
| Ch.E. 374—Unit Operations Laboratory | 2 |
| Chem. 344—Principles of Chemical Thermodynamics | 2 |
| E.E. 206—Direct and Alternating Current Circuits | 3 |
| E.E. 207—Direct and Alternating Current Laboratory | 1 |
| M.E. 204—Mechanical Engineering Laboratory | 2 |
| Electives[3] | 3 |

| | 17½ HOURS |
|---|---|
| Ch.E. 266—Inspection Trip | ½ |
| Ch.E. 377—Chemical Engineering Technology | 3 |
| Ch.E. 379—Chemical Engineering Projects | 2 |
| Ch.E. 381—Chemical Engineering Plant Design | 3 |
| E.E. 208—Direct and Alternating Current Apparatus | 3 |
| E.E. 209—Direct and Alternating Current Laboratory | 1 |
| Electives[3] | 5 |

[1] Two years of French and/or German are required for the B.S. degree. Two units of high school credit in either of these languages is equivalent to one year of college credit. Students entering without German or French in high school may substitute the second year of the language requirement for the six hours of electives referred to in Footnote 2.

[2] Six hours of electives must be chosen from the Divisions of Humanities or Social Sciences with the approval of the adviser. The courses are intended to broaden the engineer and provide an interest and liberal education in history, language, literature, philosophy, political science, or public speaking.

[3] Five hours of electives must be chosen with the approval of the adviser from advanced courses in chemical engineering, chemistry, physics, mathematics, metallurgy, or other closely allied subjects.

## Curriculum in Bioengineering

For the Degree of Bachelor of Science in Chemical Engineering

| FIRST YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Chem. 107—General Chemistry and Qualitative Analysis[1] | 5 |
| G.E.D. 106—Elements of Drawing | 3 |
| Hygiene 101—Health Lectures | 2 |
| Math. 122—Analytic Geometry[2] | 4 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | (1) |
| Military (men) | (1) |

| SECOND SEMESTER | 17 HOURS |
|---|---|
| Chem. 108—General Chemistry and Qualitative Analysis[1] | 5 |
| Math. 132—Calculus[2] | 5 |
| Physics 106—Mechanics | 4 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | (1) |
| Military (men) | (1) |

| SECOND YEAR | 16 HOURS |
|---|---|
| Chem. 124—Quantitative Analysis | 5 |
| German or French[3] | 4 |
| Math. 142—Calculus | 3 |
| Physics 107—Electricity, Magnetism, Modern Physics | 4 |
| Physical Education | (1) |
| Military (men) | (1) |

| | 17 HOURS |
|---|---|
| Chem. 240—Elementary Physical Chemistry | 3 |
| Chem. 241—Elementary Physical Chemistry Laboratory | 1 |
| German or French[3] | 4 |
| Physics 108—Heat, Sound, Light | 4 |
| T.A.M. 150—Analytical Mechanics (Statics) | 2 |
| Physical Education | (1) |
| Military (men) | (1) |
| Electives[4] | 3 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Bact. 320—General Bacteriology | 5 |
| Ch.E. 261—Stoichiometry | 3 |
| Chem. 234—Organic Chemistry | 5 |
| T.A.M. 221—Resistance of Materials | 3 |
| T.A.M. 223—Resistance of Materials Laboratory | 1 |

| | 17 HOURS |
|---|---|
| Ch.E. 370—Chemical Engineering Thermodynamics | 3 |
| Ch.E. 371—Principles of Chemical Engineering | 4 |
| Ch.E. 372—Unit Operations Laboratory | 2 |
| Chem. 336—Organic Chemistry | 3 |
| Chem. 350—Biochemistry | 5 |

| FOURTH YEAR | 17½ HOURS |
|---|---|
| Ch.E 266—Inspection Trip | ½ |
| Ch.E. 373—Principles of Chemical Engineering | 4 |
| Ch.E. 385—Bioengineering | 5 |
| Chem. 337—Organic Chemistry Laboratory | 2 |
| Chem. 342—Physical Chemistry | 3 |
| E.E. 202—Direct and Alternating Current Circuits and Machines | 2 |
| E.E. 203—Direct and Alternating Currents Circuits and Machines Laboratory | 1 |

| | 17½ HOURS |
|---|---|
| Ch.E. 266—Inspection Trip | ½ |
| Ch.E. 386—Bioengineering | 5 |
| Ch.E. 381—Chemical Engineering Plant Design | 3 |
| Chem. 344—Principles of Chemical Thermodynamics | 2 |
| E.E. 204—Application of Electrical Equipment | 2 |
| E.E. 205—Electrical Equipment Laboratory | 1 |
| Electives[4] | 4 |

[1] Students without entrance credit in chemistry take the sequence Chem. 101, 106, 110, 124, etc.

[2] Students without the required entrance credits in mathematics take Math. 112 (or 111), 114 (or 115), 122, 132, and 142.

[3] Two years of French and/or German are required for the B.S. degree. Two units of high school credit in either of these languages is equivalent to one year of college credit. Students entering without German or French in high school may substitute the second year of the language requirement for the six hours of electives referred to in Footnote 4.

[4] Six hours of electives must be chosen from the Divisions of Humanities or Social Sciences with the approval of the adviser. The courses are intended to broaden the engineer and provide an interest and liberal education in history, language, literature, philosophy, political science, or public speaking.

## Medicine and Dentistry

The three-year premedical curriculum outlined below includes the courses required for admission to the College of Medicine under the regulations governing students enrolled at Urbana for this purpose.

The work covered by the first two years of this curriculum also enables students to meet the requirements for admission to the College of Dentistry.

## Premedical Curriculum

This curriculum, which combines three years of work in the College of Liberal Arts and Sciences with one year of work in the College of Medicine, is available to students under the following conditions:

Any freshman whose scholarship rank is in the upper half of his high school graduating class, on matriculating in the College of Liberal Arts and Sciences, is eligible for admission to the premedical curriculum.

At the end of each semester the scholastic averages of all students enrolled in the premedical curriculum are computed. These students must maintain at least a 3.5 average during the first two semesters in the curriculum. By the end of the third semester, the average for the three semesters must be raised to 3.75, and this minimum average must be maintained. Students who fail to meet these minimum requirements will be transferred to the general curriculum until such time as they may have brought their averages up to the minimum.

Students applying for admission to the predentistry curriculum must have ranked in the upper half of their high school graduating class. They must maintain at all times in the curriculum a minimum average of 3.5 or they will be transferred to the general curriculum.

Students transferring to these curricula in this college with advanced standing must meet scholastic requirements at the level at which they transfer, the average to be computed in terms of the University's grading system.

Students who meet the language and liberal arts requirements and who complete three years of the premedical curriculum and the first year in the College of Medicine may, upon application, receive the degree of Bachelor of Science from the College of Liberal Arts and Sciences. No student may receive credit toward this degree for more than one year of work done in any other college or university.

Other factors being equal, students at Urbana who have completed the premedical curriculum with an average of 4.3 or better, will be given preferential consideration by the Committee on Admissions, provided that at least the second and third years have been done within the University.

| FIRST YEAR | FIRST SEMESTER | 15 TO 18 HOURS |
|---|---|---|
| Chem. 101 or 102—General Chemistry[1] | | 5 or 3 |
| Hygiene 101—Health Lectures | | 2 |
| Rhet. 101—Rhetoric and Composition | | 3 |
| Zool. 101—General Zoology | | 5 |
| Physical Education | | 1 |
| Military (men) | | 1 |
| Electives | | 0 to 3 |

| SECOND SEMESTER | 15 TO 18 HOUR |
|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | |
| Math. 114—Plane Trigonometry, or Math. 104—Elements of Algebra and Trigonometry[2] | 2 or |
| Rhet. 102—Rhetoric and Composition | |
| Zool. 132—Comparative Vertebrate Anatomy | |
| Physical Education | |
| Military (men) | |
| Electives | 0 to |

[1] Students having credit for chemistry in high school will register for Chem. 102 (3 hours).

[2] Math. 114 is a prerequisite for physics in the second year and may be taken in either the first or second semester of the first year, or may be replaced by an elective if the student has credit for trigonometry in high school. Math. 104 (3 hours) will be substituted by students who have only two units of mathematics in high school.

| SECOND YEAR | 16 TO 18 HOURS |
|---|---|
| Chem. 122 — Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 |
| Modern Language[1] | 4 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[2] | 2 to 4 |

| | 16 TO 18 HOURS |
|---|---|
| Chem. 122 — Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 |
| Modern Language[1] | 4 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[2] | 2 to 4 |

| THIRD YEAR | 16 TO 18 HOURS |
|---|---|
| Chemistry 247—Elementary Physical Chemistry, or Zool. 333—Vertebrate Embryology | 4 or 5 |
| Modern Language[1] | 4 |
| Electives[2] | 3 to 10 |

| | 16 TO 18 HOURS |
|---|---|
| Chemistry 247—Elementary Physical Chemistry, or Zool. 333—Vertebrate Embryology | 4 or 5 |
| Modern Language[1] | 4 |
| Electives[2] | 3 to 10 |

## Prenursing Curriculum

To qualify for a degree of Bachelor of Science in Nursing, a student must complete a two-year program at the Urbana campus or at the Chicago Undergraduate Division at Navy Pier, followed by thirty to thirty-six months of professional training in one of the affiliated hospitals in Chicago. The four affiliated hospitals are Cook County, Michael Reese, Presbyterian, and St. Luke's Schools of Nursing.

Admission to the prenursing curriculum is restricted to students sixteen to twenty-eight years old. Students twenty-eight to thirty-three years old may enter subject to approval of the nursing advisory committee.

A minimum of sixty semester hours is required in the preprofessional program as indicated below:

| | HOURS |
|---|---|
| Biological Sciences (including a course in bacteriology) | 8 |
| Chemistry (one year of general and one semester of organic chemistry) | 10 |
| Humanities | 6 |
| Physics (a course specially designed for nurses or D.G.S. 141) | 4 |
| Rhetoric and Composition | 6 |
| Social Sciences (including the equivalent of a course in sociology and a course in psychology) | 12 |
| Physical Education (four semesters) | |
| Electives (one year of foreign language recommended) | 14 |
| Total | 60 |

[1] Two semesters of a modern language (German, French, Spanish, etc.) at the college level are required for admission to the College of Medicine. The equivalent of two years of college work in a foreign language is required of students who are candidates for the bachelor's degree in the combined curriculum. (See Prescribed Subjects, item 5, page 167.)

[2] Electives in the second and third years should be arranged to satisfy the requirements for admission to the medical school which the student expects to enter. The College of Medicine of the University of Illinois requires fourteen semester hours from at last two of the following: economics, history, philosophy, political science, psychology, and sociology. It is recommended that students who will be candidates for a degree from the College of Liberal Arts and Sciences at the end of the first year in the College of Medicine plan to meet the general education sequence in social science by taking one of the following: Hist. 111, 112; Pol. Sci. 101, 102; Psych. 105, 106; or Sociol. 104, 105. The student should also satisfy the humanities sequence by one of the following: Phil. 101, 102, 105; Phil. 303, 306.

## Continuation Program in Nursing

This program leads to the degree of Bachelor of Science in Nursing, which is conferred by the School of Nursing. It is open to holders of the Diploma in Nursing conferred by one of the affiliated hospital schools: Michael Reese, Presbyterian, St. Luke's, Cook County, all of Chicago. Candidates will be admitted to this program beginning September, 1952.

The program consist of four semesters, plus one summer session or half-semester of eight weeks. The first two semesters are in the College of Liberal Arts and Sciences, either in Urbana or at the Chicago Undergraduate Division, the third semester in the College of Liberal Arts and Sciences in Urbana, the remainder in the University of Illinois School of Nursing, with residence as indicated.

### REQUIREMENTS FOR ADMISSION

Candidates shall apply to the College of Liberal Arts and Sciences for admission to the program, which will be granted upon fulfillment of the following conditions.

1. Certification by the University of Illinois School of Nursing that the candidate holds the Diploma in Nursing from one of the affiliated schools, there received grades averaging 3.5 in theory and practice, and is recommended by the affiliated school.
2. Satisfaction of the requirements for admission to the general curriculum in the College of Liberal Arts and Sciences.
3. Certification by the University of Illinois School of Nursing that the candidate has achieved on the Graduate Nurse Test Battery of the National League of Nursing Education a score not lower than 1½ s.d. below the mean of collegiate norms for each of the clinical fields. This certification shall entitle the candidate to a block credit of forty semester hours in Clinical Nursing.
4. Certification by the University of Illinois School of Nursing that the candidate has passed examinations (as set by the National League of Nursing Education) for advanced standing in Microbiology (four semester hours) and Anatomy and Physiology (five semester hours).
5. Passing of examinations for advanced standing in Rhetoric and Composition (six semester hours), and General Chemistry (five semester hours), administered by the appropriate departments of the College of Liberal Arts and Sciences.
6. Failure to demonstrate proficiency in any or all of the fields listed under paragraphs 4 and 5 shall not preclude admission to the Continuation Program, but shall require adding to the candidate's program appropriate courses in the subjects indicated. Courses taken for making up such deficiencies shall not in any case count as electives within the sixty semester hours of the Continuation Program.

### REQUIREMENTS FOR GRADUATION

Each candidate for the degree must earn 120 semester hours, including thirty hours of advanced work done in residence. Sixty of these hours shall be those specified in paragraphs 3, 4, and 5 under Admission, above. The remaining sixty hours, constituting the Continuation Program proper, must be passed with an over-all average of 3.0, and shall be made up as follows, subject to such rearrangement of courses or lengthening of the period of study as may be required because of entrance deficiencies, which should be removed within the first year.

| FIRST YEAR FIRST SEMESTER 15 TO 17 HOURS | | SECOND SEMESTER 15 OR 16 HOURS | |
|---|---|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 | Chem. 133—Elementary Organic Chemistry | 5 |
| D.G.S. 141—Physical Science (or Physics 105 for Students at Chicago) | 4 | Humanities[1] | 4 |
| Humanities[1] | 4 | Psych. 150—Personality and Social Behavior | 3 |
| Electives[2] | 2 to 4 | Electives[2] | 3 or 4 |

[1] A humanities general education sequence or courses in literature. May be deferred to senior year if student needs to remove deficiencies during the first year.

[2] Suggested electives are: mathematics, foreign language, history, literature, or music appreciation. Electives may be deferred until senior year if student needs to remove deficiencies during the first year.

| SECOND YEAR — FIRST SEMESTER (URBANA) | HOURS |
|---|---|
| Social Sciences | 6 or 9 |
| For students electing Community Nursing: | |
| Psych. 216—Child Psychology | 3 |
| Sociol. 220—Marriage and the Family | 3 |
| Sociol. 276—Sociology of the City, or Sociol. 277—Rural Sociology | 3 |
| For students electing Institutional Nursing: | |
| Psych. 250—Psychology of Personality | 3 |
| Psych. 255—Social Psychology, or Psych. 338—Abnormal Psychology, or Sociol. 212—Culture Patterns and the Individual | 3 |
| Phil. 105—Moral Ideas and Practice | 2 |
| Ed. 211—Educational Psychology | 3 |
| Electives (other courses in social sciences, or courses in the biological sciences, or other courses with permission of the Director of the School of Nursing, to total at least 15 hours) | |

**SECOND YEAR — SECOND SEMESTER (URBANA OR CHICAGO)**

Students transfer to the University of Illinois School of Nursing as candidates for the degree of Bachelor of Science in Nursing. Courses in this group will be offered alternately at the Chicago Professional Colleges and on the Urbana campus, if registration warrants.

| | |
|---|---|
| Nursing 301—Introduction to Community Nursing (for students electing Community Nursing), or Nursing 300—Introduction to Management in Nursing (for students electing Institutional Nursing) | 3 |
| Nursing 200—Principles of Health Teaching | 2 |
| Nursing 302—Seminar in Trends and Problems in Nursing Services | 3 |
| Electives (as required to bring total credit hours to 116 in this semester; minimum, 3 hours) | |

**SUMMER SESSION OR HALF SEMESTER**

| | |
|---|---|
| Nursing 311—Field Practice in Community Nursing (for students electing Community Nursing), or Nursing 310—Field Practice in Management in Nursing (for students electing Institutional Nursing) | 4 |

## Preveterinary Curriculum

Students applying for admission to the preveterinary curriculum must rank in the upper half of their high school graduating class. They must maintain at least a 3.5 average to remain in the curriculum, otherwise they will be transferred to the general curriculum.

Students transferring with advanced standing must have maintained at least a 3.5 average in terms of the University's grading system.

A minimum of sixty semester hours is required in the preprofessional curriculum.

| FIRST YEAR — FIRST SEMESTER — 15 TO 18 HOURS | |
|---|---|
| Chem. 101 or 102—General Chemistry | 3 or 5 |
| Hygiene 101—Health Lectures | 2 |
| Math. 114—Plane Trigonometry, or Math. 104—Elements of Algebra and Trigonometry | 2 or 3 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Zool. 101—General Zoology | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER* — 16 TO 19 HOURS | |
|---|---|
| Bot. 100—General Botany | 4 |
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 4 to 7 |

| SECOND YEAR | 16 TO 18 HOURS |
|---|---|
| Chem. 122—Elementary Quantitative Analysis, or Chem. 133—Elementary Organic Chemistry | 5 |
| Language[1] | 4 |
| Physics 101—General Physics (Mechanics, Heat, and Sound) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 to 4 |

| | 16 TO 18 HOURS |
|---|---|
| Chem. 133—Elementary Organic Chemistry, or Chem. 122—Elementary Quantitative Analysis | 5 |
| Language[1] | 4 |
| Physics 102—General Physics (Light, Electricity, and Magnetism) | 5 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 to 4 |

## Curriculum in Occupational Therapy

This curriculum, which is open to both men and women, combines six semesters of work in the College of Liberal Arts and Sciences with five terms in the College of Medicine.

The work on the Urbana campus, which is mainly of a preprofessional character, is shown below. The student must accumulate a minimum of ninety semester hours and satisfy all of the preprofessional requirements before transferring to the College of Medicine. A minimum average of 3.5 must be maintained at all times in the curriculum.

| FIRST YEAR | HOURS |
|---|---|
| Rhet. 101-102—Rhetoric and Composition, or D.G.S. 111-112—Verbal Communication | 6 or 8 |
| Zool. 101—General Zoology | 5 |
| Therapeutic Techniques[2] | 7 |
| Electives (foreign language, history, literature) | 8 to 10 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| Physical Education | 2 |
| Total | 30 to 34 |

| SECOND YEAR | |
|---|---|
| O.T. 100—Occupational Therapy Orientation | 2 |
| Psych. 100—Introduction to Psychology | 4 |
| Sociol. 100—Principles of Sociology | 3 |
| Therapeutic Techniques[2] | 15 |
| Physical Education | 2 |
| Electives[3] | 4 to 6 |
| Total | 30 to 32 |

| THIRD YEAR | |
|---|---|
| Hygiene 216—Medical Terminology Correlated with Community Health Problems | 2 |
| Physiol. 134—Human Anatomy and Physiology | 5 |
| Physiol. 235—Kinesiology | 3 |
| Psych. 216—Child Psychology | 3 |
| Therapeutic Techniques[2] | 12 |
| Electives (must include two hours of psychology) | 5 to 7 |
| Total | 30 to 32 |

[1] The student's attention is called to the advantages of continuing with the same language as was accepted for admission to the preveterinary curriculum.

[2] Designated courses selected with consent of the head of the department from art, home economics, physical education, industrial education, and music.

[3] Suggested electives are: foreign language, history (American, English, European), art, literature, library science, and music appreciation.

## Curriculum Preparatory to the Teaching of Biology

For the Degree of Bachelor of Science in the Teaching of the Biological Sciences and General Science

This curriculum is for students preparing to teach biology and general science as major areas of specialization. A minimum of 123 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR | HOURS |
|---|---|
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition, and Speech 101—Principles of Effective Speaking; or D.G.S. 111-112—Verbal Communication | |
| Biological Sciences | 8 or 9 |
| Bot. 100—General Botany, and Zool. 101 or 104—General Zoology; or D.G.S. 131-132—Biological Science; or equivalent | |
| Foreign Language | 8 |
| A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance. | |
| Hygiene | 2 |
| Hygiene 101—Health Lectures | |
| Electives[1] | 4 or 5 |
| Physical Education | 2 |
| Military (men) | 2 |
| Minimum Hours for First Year | 34 |

| SECOND YEAR | |
|---|---|
| Chemistry | 5 or 3 |
| Chem. 101 or 102—General Chemistry, or equivalent | |
| Education | 2 |
| Ed. 101—The Nature of the Teaching Profession | |
| History | 3 |
| Hist. 152—History of the United States, 1865-1952 | |
| Physiology | 4 |
| Physiol. 103—Introduction to Human Physiology, or equivalent | |

[1] Not more than one-third of the total elective hours may be chosen from the sciences. The remainder should be selected, with the approval of the adviser, from the humanities and social sciences. The following science courses are especially recommended as electives: Anthrop. 107; Astron. 201 and 202; Bact. 106 and 308; Bot. 116 and 340; Geog. 111 and 123; Hort. 121 and 242; Math. 112 or 111; Zool. 107, 132, 341, and 351.

The following elective courses in the humanities and social sciences are especially recommended as electives: Art 111 and 112; Classics 101; Econ. 102 and 103; Engl. 101, 113, 131, 253, 355, and 356; Rhet. 144, 205, and 206; Hist. 111, 112, 131, 132, 181, 304, and 357; Journ. 215; Music 110 and 114; Phil. 101, 102, and 303; Psych. 130, 150, and 216; Sociol. 100; D.G.S. 151 and 152; and advanced courses in any foreign language.

Systematic Botany ..... 3
Bot. 160—Introductory Systematic Botany, or Bot. 366—Field Botany (summer only in junior or senior year)

Plant Morphology ..... 3
Bot. 120—Survey of the Plant Kingdom, or Bot. 304—General Plant Morphology (in junior or senior year)

Political Science ..... 3
Pol. Sci. 150—American Government, or equivalent

Psychology ..... 4
Psych. 100—Introduction to Psychology, or Psych. 103—Human Behavior

Physical Education ..... 2

Military (men) ..... 2

Electives[1] ..... 2 to 4

Minimum Hours for Second Year ..... 31

THIRD YEAR

Education ..... 4
Ed. 201—Foundations of American Education, and Ed. 240—Principles of Secondary Education

Bacteriology ..... 4
Bact. 104-105—Introductory Bacteriology

Physical Science ..... 8 or 9
D.G.S. 141-142—Physical Science, or one course each in astronomy, geology, and physics

Geography ..... 4
Geog. 101—Elements of Geography, or equivalent

Entomology ..... 4 or 5
Entom. 103—Life of Insects, or Entom. 101-102—Destructive and Useful Insects

Ornithology ..... 3
Zool. 335—Ornithology

Electives[1] ..... 3 or 4

Minimum Hours for Third Year ..... 32 or 33

FOURTH YEAR FIRST SEMESTER

Genetics ..... 4 or 5
Bot. 322—Genetics, or Zool. 351-352—Genetics, or equivalent

Field Zoology ..... 3
Zool. 304—Field Zoology

Ecology ..... 3
Bot. 381—Plant Ecology, or Zool. 345—Animal Ecology and Geography, or Zool. 342—Wildlife Management and Conservation

Humanities ..... 3 or 4
Courses in English literature, philosophy, or history (other than Hist. 152)

Electives[1] ..... 3 or 4

Minimum Hours for First Semester ..... 16

[1] Not more than one-third of the total elective hours may be chosen from the sciences. The remainder should be selected, with the approval of the adviser, from the humanities and social sciences. The following science courses are especially recommended as electives: Anthrop. 107; Astron. 201 and 202; Bact. 106 and 308; Bot. 116 and 340; Geog. 111 and 123; Hort. 121 and 242; Math. 112 or 111; Zool. 107, 132, 341, and 351.

The following elective courses in the humanities and social sciences are especially recommended as electives: Art 111 and 112; Classics 101; Econ. 102 and 103; Engl. 101, 113, 131, 253, 355 and 356; Rhet. 144, 205, and 206; Hist. 111, 112, 131, 132, 181, 357, and 304; Journ. 215; Music 110 and 114; Phil. 101, 102, and 303; Psych. 130, 150, and 216; Sociol. 100; D.G.S. 151 152; and advanced courses in any foreign language.

FOURTH YEAR SECOND SEMESTER

| | |
|---|---|
| Education | 11 |
| Ed. 211—Educational Psychology, Ed. 241—Technic of Teaching in the Secondary School, and Ed. 242—Educational Practice in Secondary Education | |
| Biology | 2 |
| Bot. 306 or Zool. 306—Biology for Teachers | |
| Minimum Hours for Second Semester | 13 |

For the Degree of Master of Science in the Teaching of the Biological Sciences and General Science

Candidates for the degree of Master of Science in the Teaching of the Biological Sciences and General Science must earn four units in biological sciences, two units in education, and two units in electives. The courses in the biological sciences and the electives must be selected with the approval of the adviser. The electives may be in the biological sciences, in education, or, in exceptional cases, in other fields. A course in biological chemistry and one in experimental psychology are strongly advised.

| FIFTH YEAR | UNITS |
|---|---|
| Biological Sciences | 4 |
| Electives | 2 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Total | 8 |

## Biology as a First Teacher Education Minor

| | HOURS |
|---|---|
| Bact. 104-105—Introductory Bacteriology | 5 |
| Bot. 100—General Botany | 4 |
| Entom. 101-102—Destructive and Useful Insects | 5 |
| Zool. 101—General Zoology | 5 |
| Total | 19 |

## Biology as a Second Teacher Education Minor

| | HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Entom. 101—Destructive and Useful Insects | 3 |
| Physiol. 103—Introduction to Human Physiology | 4 |
| Zool. 101—General Zoology | 5 |
| Total | 16 |

## General Science as a Teacher Education Minor

| | HOURS |
|---|---|
| Bot. 100—General Botany | 4 |
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| N.G.S. 141-142—Physical Science | 8 |
| Geog. 101—Elements of Geography | 5 |
| Zool. 101—General Zoology | 5 |
| Total | 25 or 27 |

## Curriculum Preparatory to the Teaching of Chemistry

For the Degree of Bachelor of Science in the Teaching of Chemistry

This curriculum is for students preparing to teach physical science with a major chemistry and with minors in physics and mathematics. The courses outlined below tot 127 to 132 hours. A minimum of 125 hours of credit, not counting the first two years work in military and physical education, is required for graduation.

If the student has not had adequate high school training in mathematics, he may l required to take Math. 106 or other elementary mathematics.

If the student has had no foreign language in high school or if he does not contin in the University the same language which he began in high school, it will be necessa for him to take two years of foreign language rather than the one year specified belo

Applications for student teaching are accepted twice each year. Students who a on the campus during the spring semester prior to the year they expect to enroll in st dent teaching must apply for admission to Educational Practice during February of th semester. Students who are not on the campus during the spring semester prior to t year they expect to enroll in student teaching are allowed to apply during the first thr weeks of the fall semester. Application forms may be obtained in the Office of Stude Teaching, 208 Gregory Hall.

| FIRST YEAR — FIRST SEMESTER | 16 TO 19 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures, or Elective | 2 |
| Math. 117—Combined Freshman Mathematics | 5 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[1] | 2 |

| SECOND SEMESTER | 17 OR 18 HOU |
|---|---|
| Chem. 106—Inorganic Chemistry[1] | |
| Ed. 101—The Nature of the Teaching Profession | |
| Hygiene 101—Health Lectures, or Elective | |
| Math. 127—Combined Freshman Mathematics | |
| Rhet. 102—Rhetoric and Composition | |
| Physical Education | |
| Military (men) | |

| SECOND YEAR | 15 OR 16 HOURS |
|---|---|
| Chem. 110—Qualitative Analysis | 5 |
| Foreign Language[2] | 4 |
| Physics 101 or 103—General Physics | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 15 OR 16 HOU |
|---|---|
| Chem. 124—Quantitative Analysis | |
| Foreign Language[2] | |
| Physics 102 or 104—General Physics | |
| Physical Education | |
| Military (men) | |

| THIRD YEAR | 18 HOURS |
|---|---|
| Chem. 133—Elementary Organic Chemistry, or Chem. 234—Organic Chemistry | 5 |
| Math. 137—Calculus[2] | 3 |
| Physics | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Speech 101—Principles of Effective Speaking[3] | 3 |

| | 16 OR 17 HOU |
|---|---|
| Chem. 240-241—Elementary Physical Chemistry, or Chem. 350—Biochemistry | 4 or |
| Ed. 201—Foundations of American Education | |
| Ed. 240—Principles of Secondary Education | |
| Math. 147—Calculus[2] | |
| Physics | |
| Elective | |

[1] A student who takes Chem. 102 rather than Chem. 101, and who is to take four semesters foreign language in the University, should commence his language in the first semester of his u versity career. This will necessitate postponing each chemistry course (except Chem. 102) by o semester.

[2] A student who completed his foreign language requirement in high school should take Math. 1 and 147 in the sophomore year, rather than in the junior year.

[3] The speech requirement is satisfied if the student has taken D.G.S. 111 andd 112 in place Rhet. 101 and 102.

emesters of the fourth year are interchangeable.

| OURTH YEAR | 16 HOURS |
|---|---|
| list. 152—History of the United States, 1865-1952 | 3 |
| Math. 301 or 302—Fundamental Concepts of Mathematics | 3 |
| hysics | 3 |
| ol. Sci. 150—American Government | 3 |
| hemistry Elective | 2 |
| )ther Electives | 2 |

| | 12 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 |
| Ed. 242—Educational Practice in Secondary Education | 5 |

For the Degree of Master of Science in the Teaching of Chemistry

| IFTH YEAR | UNITS |
|---|---|
| hemistry | 4 |
| lectives | 2 |
| wo of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| d. 311—Psychology of Learning for Teachers | ½ |
| d. 312—Mental Hygiene and the School | ½ |
| Total | 8 |

For the Degree of Master of Science in the Teaching of the Physical Sciences

| IFTH YEAR | UNITS |
|---|---|
| hysical Science | 4 |
| lectives | 2 |
| wo of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| d. 311—Psychology of Learning for Teachers | ½ |
| d. 312—Mental Hygiene and the School | ½ |
| Total | 8 |

## 'eacher Education Minor in Chemistry

| | HOURS |
|---|---|
| hem. 101 or 102—General Chemistry | 5 or 3 |
| hem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| hem. 122—Elementary Quantitative Analysis | 5 |
| hem. 133—Elementary Organic Chemistry | 5 |
| Total | 18 to 20 |

## :urriculum Preparatory to the Teaching of English

For the Degree of Bachelor of Arts in the Teaching of English

The courses outlined below total 130 to 136 hours. A minimum of 128 hours of redit, not counting the first two years of work in military and physical education, is equired for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen hours. In addition, beginning teachers may need to complete a second teaching minor of sixteen semester hours. Desirable teaching combinations with English include art and music; double minors in French and Latin; German and Latin; history and music; history and physical education; home economics and physical education; Latin and music; Latin and physical education; Latin and Spanish; music and physical education; speech and Latin; speech and music; speech and physical education; journalism and history; journalism and Latin; speech and history.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 TO 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Hygiene 101—Health Lectures | 2 |
| Mathematics or Science[2] | 3 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Mathematics or Science[2] | 3 |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 5 |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Engl. 113—American Literature | 3 |
| Engl. 131—Introduction to Shakespeare | 3 |
| Foreign Language[1] | 4 |
| Speech Electives | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOURS |
|---|---|
| Engl. 114—American Literature | 3 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Foreign Language[1] | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 |

| THIRD YEAR | 18 HOURS |
|---|---|
| English Electives[3] | 6 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Rhet. 246—Modern English Grammar | 3 |
| Speech 141—Oral Interpretation of Literature | 3 |
| Electives | 3 |

| | 16 HOURS |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Engl. 355—Survey of English Literature | 3 |
| Journ. 308—High School Journalism | 3 |
| Lib. Sci. 304—Library Materials for Adolescents | 3 |
| Rhet. 133—Expository Writing | 3 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Six semester hours of natural science are required. The courses in biological science and physical science in the Division of General Studies are especially recommended.

[3] Six of the ten hours of English electives must be in courses restricted to advanced undergraduates

| FOURTH YEAR | 15 HOURS | | 16 HOURS |
|---|---|---|---|
| Engl. 356—Survey of English Literature | 3 | Ed. 211—Educational Psychology | 3 |
| Electives[1] (four of which must be in English) | 12 | Ed. 219—Remedial Reading in the High School | 3 |
| | | Ed. 241—Technic of Teaching in the Secondary School | 5 |
| | | Ed. 242—Educational Practice in Secondary Education | 5 |

For the Degree of Master of Arts in the Teaching of English

| FIFTH YEAR | 4 UNITS | | 4 UNITS |
|---|---|---|---|
| English[2] | 2 | English[2] | 2 |
| Electives | 1 | Electives | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| | | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |

## Teacher Education Minor in English

| | HOURS |
|---|---|
| Engl. 113-114—American Literature | 6 |
| Engl. 355-356—Survey of English Literature | 6 |
| Rhet. 101-102—Rhetoric and Composition, or D.G.S. 111-112—Verbal Communication | 6 or 8 |
| Rhet. 133—Expository Writing | 3 |
| Total | 21 to 23 |

## Curriculum Preparatory to the Teaching of French

For the Degree of Bachelor of Arts in the Teaching of French

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation. Copies of a sample curriculum in mimeographed form are available at 230 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |

[1] Six of the ten hours of English electives must be in courses restricted to advanced undergraduates. Rhet. 480 is especially recommended. Candidates for junior college teaching should take Rhet. 480.

General Education ..... 16
Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.)
Hist. 152—History of the United States, 1865-1952 ..... 3
Hygiene 101—Health Lectures ..... 2
Military (men) ..... 4
Physical Education ..... 4
Pol. Sci. 150—American Government ..... 3
Psych. 100—Introduction to Psychology ..... 4
Rhetoric and Speech ..... 8 or 9
Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature ..... 9
or D.G.S. 111-112—Verbal Communication ..... 8
Teachers' Major in French ..... 36
French 101-102—Elementary Course ..... 8
French 103-104—Modern French ..... 8
French 201-202—Introduction to French Literature ..... 6
French 211-212—Oral French ..... 4
French 213-214—Composition ..... 4
French 215-216—Advanced Conversation ..... 4
French 282—Methods of Teaching French ..... 2
Teachers' Minor ..... at least 16
Desirable teaching combinations with French include English, foreign languages, history, music, and physical education.
A double major in French and English and a double major in French and Latin with English or history as a minor subject are also recommended. Additional hours toward certification may be gained from basic courses credited from a secondary school.
Electives ..... 15 to 17
Advanced courses in French civilization and literature are recommended, particularly for students who have completed basic French courses in secondary school. Other courses in language and literature, geography, history, philosophy, art, and music are also recommended.

Total ..... at least 120

### For the Degree of Master of Arts in the Teaching of French

The student's program will be worked out in conference with the adviser in the major area of specialization. The program will total a minimum of eight units or 32 semester hours for two semesters. French 409 and 410 are required.

| FIFTH YEAR | UNITS |
|---|---|
| French 409—The Phonetics of French, and French 410—Advanced Syntax | 1 |
| French | 1 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | 2 |
| Total | 8 |

## Teacher Education Minor in French

The minor in French requires four hours of oral work supplementary to courses 101, 102, 103, and 104. Total hours required may be reduced by entrance credits in French. Additional courses recommended are French 201, 202, 213, 214, 215, 216, and 282.

| | HOURS |
|---|---|
| French 101-102—Elementary Course | 8 |
| French 103-104—Modern French | 8 |
| French 211-212—Oral French | 4 |
| Total | 20 |

## Curriculum Preparatory to the Teaching of Geography

For the Degree of Bachelor of Science in the Teaching of Geography

The courses outlined below total 127 to 131 hours. A minimum of 123 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. In addition, the beginning teacher of geography may need to be prepared to teach a second minor requiring a minimum of sixteen hours. It is strongly recommended that the minor or minors supplement the nature of the major. A major that is directed toward physical geography should select a minor from biology or geology, whereas a major directed toward cultural geography should select a minor from the social sciences. However, the combining of a physical geography major with a social studies minor or a cultural geography major with a physical science minor is advantageous for candidates expecting to teach in small high schools. For those whose major is directed toward regional geography, a second minor in foreign language, especially the language of the major region of specialization, is recommended. A minor in economic and commercial subjects is another possibility.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 OR 17 HOURS | SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|---|---|
| Geog. 101—Elements of Geography[1] | 5 | Geog. 104—World Regional Geography | 3 |
| Rhet. 101—Rhetoric and Composition | 3 | Rhet. 102—Rhetoric and Composition | 3 |
| Foreign Language[2] | 4 | Foreign Language[2] | 4 |
| Physical Education | 1 | Hygiene 101—Health Lectures | 2 |
| Military (men) | 1 | Physical Education | 1 |
| Electives | 3 | Military (men) | 1 |
| | | Electives | 3 |

[1] Of the thirty-two hours of geography required for certification, ten hours must consist of Geog. 101, 104, and 371. The remaining twenty-two hours may be selected by permission of the adviser from the course offerings of the Department of Geography, including in the selection at least one course from each of the following: physical geography; economic, social, or political geography; regional geography; and geographic techniques.

[2] A reading knowledge of a foreign language (German, French, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104 or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

| SECOND YEAR | 16 OR 17 HOURS | | 16 OR 17 HOURS |
|---|---|---|---|
| Geography | 3 | Geography | |
| Ed. 101—The Nature of the Teaching Profession | 2 | Physical Education | |
| Psych. 100—Introduction to Psychology | 4 | Military (men) | |
| Speech 101—Principles of Effective Speaking | 3 | Electives | 12 |
| Physical Education | 1 | | |
| Military (men) | 1 | | |
| Electives | 3 | | |

| THIRD YEAR | 16 HOURS | | 17 HOURS |
|---|---|---|---|
| Geography | 4 | Geography | |
| Ed. 201—Foundations of American Education | 2 | Pol. Sci. 150—American Government | |
| Ed. 240—Principles of Secondary Education | 2 | Electives | |
| Hist. 152—History of the United States, 1865-1952 | 3 | | |
| Electives | 5 | | |

| FOURTH YEAR | 13 HOURS | | 17 HOURS |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Geography | |
| Ed. 241—Technic of Teaching in the Secondary School | 5 | Geog. 371—Introduction to Research | |
| Ed. 242—Educational Practice in Secondary Education | 5 | Electives | |

For the Degree of Master of Science in the Teaching of Geography

| FIFTH YEAR | 4 UNITS | | 4 UNITS |
|---|---|---|---|
| Geog. 495—Advanced Studies in Geography | 1 | Geog. 494—Research | 1 |
| Geography Elective | 1 | Geography Elective | 1 |
| Electives | 1 | Electives | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ | Two of the following: | |
| Ed. 312—Mental Hygiene and the School | ½ | Ed. 301—Philosophy of Education | ½ |
| | | Ed. 302—History of American Education | ½ |
| | | Ed. 303—Comparative Education | ½ |
| | | Ed. 304—Social Foundations of Education | ½ |

## Teacher Education Minor in Geography

| | HOURS |
|---|---|
| Geog. 101—Elements of Geography | |
| Geog. 105—Introductory Economic Geography | |
| Geography (regional courses)[1] | |
| Total | 1 |

## Curriculum Preparatory to the Teaching of German

For the Degree of Bachelor of Arts in the Teaching of German

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation. Copies of a sample curriculum i

[1] It is recommended that regional courses be taken in related sequences, such as Eastern and Western North America, Caribbean and South America. These courses should be selected from Geog. 111, 221, 222, 231, 232, 313, 342, and 351.

mimeographed form are available at 217 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 4 |
| Physical Education | 4 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in German | 42 to 44 |
| German 101-102—Elementary Course[1] | 8 |
| German 103—Intermediate Course | 4 |
| German 104—Intermediate Course, or German 144—Scientific German | 4 |
| German 210—Masterpieces of German Literature | 3 |
| German 211-212—Conversation and Writing[2] | 4 |
| German 251—Modern German Fiction, German 252—Modern German Drama, or German 260—Lyrics and Ballads | 3 |
| German 281—Teachers' Course | 2 |
| German 301-302—Survey of German Literature, German 311-312—Goethe and Goethe's "Faust," or German 331-332—German Classics, or German 291-292—Senior Thesis and Honors Course | 6 |
| German 303—Advanced Composition and Syntax[2] | 2 |
| German 360—Introduction to German Phonetics | 2 |
| Art 111—Introduction to Ancient and Medieval Art, Engl. 363—Introduction to Comparative Literature, or Music 110—Appreciation of Music | 2 or 3 |
| Art 112—Introduction to Renaissance and Modern Art, or Music 114—Appreciation of Music | 2 or 3 |
| Teachers' Minor | at least 16 |
| Desirable teaching combinations with German include English, French, history, Latin, music, physical education, or Spanish. A double major in German and English with Latin or history as a minor is also recommended. | |

[1] Students are advised to register in the intensive (spoken) sections of this course.

[2] Students who have taken the intensive (spoken) sections of German 101-102 may be excused from German 211. At least six hours must be selected from German 211, 212, and 303.

Electives ..... 9 to 6
Recommended electives are Art 111, 112, Engl. 363, 364, Music 110, 114, 117, Phil. 101, advanced German courses not included in the minimum program, and other language and literature courses.

Total ..... at least 120

For the Degree of Master of Arts in the Teaching of German

The work will be planned to meet the needs of the individual student on the basis of his preparation and the demands of his teaching position. Since all the classes he attends will be small, special attention will always be given to his professional needs.

| FIFTH YEAR | UNITS |
|---|---|
| Courses to be chosen from the following | 2 to 2½ |
| German 301—German Literature to the Eighteenth Century | 1 |
| German 302—German Literature Since the Eighteenth Century | 1 |
| German 311—Goethe | 1 |
| German 312—Goethe's "Faust" | 1 |
| German 320—History of German Civilization | 1 |
| German 331—German Classics I (Lessing, Herder, Wieland) | 1 |
| German 332—German Classics II (Schiller, Kleist, Hölderlin, Jean Paul) | 1 |
| German 415—Middle High German | 1 |
| German Courses Open Only to Graduates (numbered 400 and up) | 1½ to 2 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | |
| Total | |

## Teacher Education Minor in German

| | HOUR |
|---|---|
| German 101-102—Elementary Course | |
| German 103—Intermediate Course | |
| German 104—Intermediate Course, or German 144—Scientific German | |
| Five hours selected from the following: | |
| German 210—Masterpieces of German Literature | |
| German 211—Conversation and Writing | |
| German 212—Conversation and Writing | |
| German 303—Advanced Composition and Syntax | |
| Total | 2 |

## Curriculum Preparatory to the Teaching of Latin

For the Degree of Bachelor of Arts in the Teaching of Latin

A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Copies of a sample curriculum in mimeographed form are available at 126 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of the semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three

weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| | HOURS |
|---|---|
| Education | 17 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 16 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Hygiene 101—Health Lectures | 2 |
| Military (men) | 4 |
| Physical Education | 4 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rhetoric and Speech | 8 or 9 |
| Rhet. 101-102—Rhetoric and Composition, Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in Latin[1] | 34 to 42 |
| Latin 101-102—Elementary Latin | 8 |
| Latin 103-104—Intermediate Latin | 8 |
| Latin 113-114—Latin Composition | 4 |
| Latin 162—Roman Antiquities | 1 |
| Latin 201-202—Survey of Latin Literature | 6 |
| Latin 301—Livy and Tacitus, Latin 302—Horace, Latin 303—Cicero, Latin 304—Vergil (any two) | 6 |
| Latin 311-312—Advanced Latin Composition | 4 |
| Classics 101—Mythology of Greece and Rome | 2 |
| Hist. 383—The Roman Republic | 3 |
| Teachers' Minor | at least 16 |
| Desirable teaching combinations with Latin include a minor in English or Spanish, a double minor in English and Spanish, a double major in Latin and English or Latin and a foreign language (Spanish, French, or German), or any combination of language with an additional minor in social studies, physical education, or library science. Additional hours toward certification may be gained from basic courses credited from secondary school. | |
| Electives | 8 to 17 |
| Recommended electives are Greek 101, 102, 201, 202; Hist. 181, 182, 381; Humanities 301; Phil. 303; and advanced courses in Latin. | |
| Total | at least 120 |

For the Degree of Master of Arts in the Teaching of Latin

The work will be planned to meet the needs of the individual student on the basis of his preparation and of the demands of his teaching position. Since all the classes he attends will be small, special attention will always be given to his professional needs.

[1] Students entering with two units of high school Latin will begin with Latin 103; those entering with three units will begin with Latin 104; those entering with four units will begin with Latin 101 and will add one more course from 301-304.

Candidates for this degree must earn four units in Latin and two units in education. At least two of the units in Latin must be in courses numbered 400 or above.

| FIFTH YEAR | UNITS |
|---|---|
| Latin Courses Open Only to Graduates | 2 |
| Courses to be chosen from the following | 2 |
| Latin 301—Livy and Tacitus | ½ |
| Latin 302—Horace | ½ |
| Latin 303—Cicero | ½ |
| Latin 304—Vergil | ½ |
| Latin 311—Advanced Latin Composition | ½ |
| Latin 312—Advanced Latin Composition | ½ |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | 2 |
| Total | 8 |

## Teacher Education Minor in Latin

| | HOURS |
|---|---|
| Latin 101 and 102—Elementary Latin, or two years of high school Latin | 8 |
| Latin 103—Intermediate Latin, or three years of high school Latin | 4 |
| Latin 104—Intermediate Latin, or four years of high school Latin | 4 |
| Latin 113-114—Latin Composition | 4 |
| Latin 201-202—Survey of Latin Literature | 6 |

Latin 201 and 202 may be omitted when the study of Latin is begun in college. One course (three hours) from Latin 301, 302, 303, or 304, in addition to Latin 201 and 202, is required for those entering college with four years of high school Latin.

The total number of hours in Latin required for a minor will thus vary as follows:

| | HOURS |
|---|---|
| a. When Latin is begun in college | 20 |
| b. When two years of high school Latin have been accepted for entrance | 18 |
| c. When three years of high school Latin have been accepted for entrance | 14 |
| d. When four years of high school Latin have been accepted for entrance | 13 |

## Curriculum Preparatory to the Teaching of Mathematics

For the Degree of Bachelor of Science in the Teaching of Mathematics

This curriculum offers training for teachers of high school and junior college courses in beginning and advanced algebra, general mathematics, practical mathematics, plane and solid geometry, trigonometry, and college algebra.

The courses outlined below total 123 to 134 hours. A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Acceptable minors include commercial subjects, biology, general science, chemistry, physics, English, foreign language, social studies, and physical education. Foreign languages acceptable for a teaching minor are French, German, Latin, and Spanish.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that

semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 15 TO 17 HOURS |
|---|---|
| Oral and Written Expression[1] | 3 or 4 |
| Foreign Language[2] | 4 |
| Freshman Mathematics[3] | 5 |
| Hygiene 101—Health Lectures | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 15 TO 17 HOURS |
|---|---|
| Oral and Written Expression[1] | 3 or 4 |
| Foreign Language[2] | 4 |
| Freshman Mathematics[3] | 4 |
| Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 14 TO 17 HOURS |
|---|---|
| Biological Science[4] | 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Humanities[5] or Social Science[6] | 4 |
| Mathematics (Calculus)[7] | 3 or 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 16 OR 17 HOURS |
|---|---|
| Biological Science[4] | 4 |
| Humanities[5] or Social Science[6] | 4 |
| Mathematics (Calculus)[7] | 3 |
| Psych. 100—Introduction to Psychology,[4] or Elective | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 16 OR 17 HOURS |
|---|---|
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Math. 301—Fundamental Concepts of Mathematics | 3 |
| Math. 311—Advanced Algebra | 3 |
| Physical Science[8] | 4 or 5 |
| Elective | 3 |

| | 16 OR 17 HOURS |
|---|---|
| Math. 302—Fundamental Concepts of Mathematics | 3 |
| Math. 312—Advanced Algebra | 3 |
| Physical Science[8] | 4 or 5 |
| Pol. Sci. 150—American Government | 3 |
| Elective | 3 |

[1] The certification requirement of oral and written expression may be satisfied by either of the following sequences of courses: D.G.S. 111 and 112, or Rhet. 101 and 102 and Speech 101.

[2] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 44, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[3] A student who enters the University with one and a half units of high school algebra and one unit of plane geometry may satisfy the freshman mathematics requirement by completion of either of the following sequences of courses: Math. 117 and 127, or Math. 112, 114, and 122. A student who enters the University with one unit of high school algebra and one unit of plane geometry will satisfy the requirement by completion of the following sequence: Math. 111, 114, and 122. A student who enters the University without one-half unit in solid geometry must remove this deficiency by either taking Math. 106 or passing a proficiency examination in that course.

[4] The biological science requirement may be satisfied by completion of one of the following sequences: Physiol. 103 and Psych. 103; Bot. 100 and Zool. 104; or D.G.S. 131 and 132. Students whose minor teaching subject is not general science or biology and who elect as their biological science Physiol. 103 and Psych. 103 will have satisfied the prerequisite for Ed. 211 and are excused from Psych. 100. Students whose minor teaching subject is either general science or biology are required to take Bot. 100 and Zool. 104, or D.G.S. 131 and 132 and Psych. 100.

[5] The humanities requirement may be satisfied by a minor in the humanities (including foreign language) or by any one of the following sequences: D.G.S. 121 and 122; D.G.S. 161 and 162; Engl. 121 and 122; Humanities 211 and 212; Hist. 111 and 112; Hist. 131 and 132 and a course in English literature; Engl. 253, 363, and 364; Classics 101, 103, and 106; Classics 103, 106, and 110; Phil. 101, 102, and 105; Phil. 303 and 306.

[6] The social science requirement may be satisfied by a minor in the social sciences or by either of the following sequences: D.G.S. 151 and 152; or Sociol. 104 and 105.

[7] Those students who take Math. 117 and 127 during their freshman year should take Math. 137 and 147 during their sophomore year. Those students who take Math. 112, 114, and 122, or Math. 111, 114, and 122 must take Math. 132 and 142.

[8] The physical science requirement may be satisfied by a minor in chemistry or by any one of the following sequences: D.G.S. 141 and 142; Physics 101 and 102; Physics 103 and 104.

| FOURTH YEAR | 16 HOURS |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Math. 222—Advanced Aspects of Euclidean Geometry | 3 |
| Electives | 9 |

| | 16 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Math. 205—Teachers' Course | 3 |

For the Degree of Master of Science in the Teaching of Mathematics

| FIFTH YEAR | 4 UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Math. 317—Introduction to Higher Algebra, or Math. 327—Introduction to Higher Geometry | 1 |
| Mathematics Elective | 1 |
| Elective | 1 |

| | 4 UNITS |
|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Math. 318—Introduction to Higher Algebra, or Math. 328—Introduction to Higher Geometry | 1 |
| Mathematics Elective | 1 |
| Elective | 1 |

## Teacher Education Minor in Mathematics

| | HOURS |
|---|---|
| Math. 117 and 127—Combined Freshman Mathematics | 9 |
| Math. 137 and 147—Calculus | 6 |
| Math. 301—Fundamental Concepts of Mathematics | 3 |
| Math. 302—Fundamental Concepts of Mathematics (recommended but not required) | 3 |
| Total | 18 to 21 |

## Curriculum Preparatory to the Teaching of Mathematics and the Physical Sciences

For the Degree of Bachelor of Science in the Teaching of Mathematics and the Physical Sciences

This curriculum satisfies the requirements for mathematics as a major teaching subject, with chemistry and physics (also general science) as minor teaching subjects. The courses outlined below total 129 to 135 hours. A minimum of 123 hours of credit, not counting the first two years in military and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 15 TO 18 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| D.G.S. 111—Verbal Communication | 4 |
| Hygiene 101—Health Lectures | 2 |
| Math. 117—Combined Freshman Mathematics | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 OR 17 HOURS |
|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 5 |
| D.G.S. 112—Verbal Communication | 4 |
| English or American Literature | 2 |
| Math. 127—Combined Freshman Mathematics | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Biology | 4 |
| Chem. 122—Elementary Quantitative Analysis | 5 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Math. 132—Calculus | 5 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOURS |
|---|---|
| Biology | 4 |
| Chem. 133—Elementary Organic Chemistry | 5 |
| Math. 142—Calculus | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Math. 301—Fundamental Concepts of Mathematics | 3 |
| Math. 311—Advanced Algebra | 3 |
| Phil. 102—Logic | 3 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |

| | 15 HOURS |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| Math. 302—Fundamental Concepts of Mathematics | 3 |
| Math. 312—Advanced Algebra | 3 |
| Physics 104—General Physics (Electricity, Magnetism, Light, and Modern Physics) | 5 |

| FOURTH YEAR | 16 HOURS |
|---|---|
| Math. 205—Teachers' Course | 3 |
| Math. 222—Advanced Aspects of Euclidean Geometry | 3 |
| Phil. 303—History of Greek and Roman Philosophy, or Phil. 306—History of Modern Philosophy | 4 |
| Physics 341—Electricity and Magnetism | 3 |
| Pol. Sci. 150—American Government | 3 |

| | 16 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| Physics 342—Electricity and Magnetism | 3 |

For the Degree of Master of Science in the Teaching of Mathematics and the Physical Sciences

| FIFTH YEAR | 4 UNITS |
|---|---|
| Chem. 240—Physical Chemistry | 1 |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Math. 347—Introduction to Higher Analysis: Real Variables, or Math. 343—Advanced Calculus | 1 |
| Elective | 1 |

| | 4 UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Math. 348—Introduction to Higher Analysis: Complex Variables, or Math. 345—Differential Equations and Orthogonal Functions | 1 |
| Physics 322—Theoretical Mechanics | 1 |
| Elective | 1 |

## Curriculum Preparatory to the Teaching of Physics

For the Degree of Bachelor of Science in the Teaching of Physics

This program is for students preparing to teach physical science. Students entering this curriculum should have two and one-half units of high school mathematics. A minimum of 129 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 14 TO 18 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| Hygiene 101—Health Lectures | 2 |
| Math. 112—College Algebra | 3 |
| Math. 114—Plane Trigonometry | 2 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 16 TO 19 HOURS |
|---|---|
| Chem. 105—Inorganic Chemistry and Qualitative Analysis | 4 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Rhet. 102—Rhetoric and Composition, and Speech 101—Principles of Effective Speaking, or D.G.S. 112—Verbal Communication | 6 or 4 |
| Math. 122—Analytic Geometry | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 18 OR 19 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Math. 132—Calculus | 5 |
| Physics 103—General Physics (Mechanics, Heat, and Sound) | 5 |
| Pol. Sci. 150—American Government | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Math. 142—Calculus | 5 |
| Physics 104—General Physics, Electricity, Magnetism, Light, and Modern Physics) | 5 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 17 OR 18 HOURS |
|---|---|
| Chem. 122—Elementary Quantitative Analysis | 5 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Physics 281—Intermediate Atomic Physics | 3 |
| Electives[2] | 6 or 7 |

| | 16 OR 17 HOURS |
|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 3 |
| Physics 360 or 260—Heat | 3 or 2 |
| Electives[2] | 6 or 7 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Students are strongly advised to concentrate their electives to obtain additional and appropriate teaching subjects such as biology. Electives chosen from the humanities and social sciences are also recommended.

| FOURTH YEAR | 16 OR 17 HOURS |
|---|---|
| Physics (241 or 221 if offered) | 3 |
| Physics 270—Intermediate Light | 3 |
| Electives | 10 or 11 |

| | 13 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 5 |
| Ed. 242—Educational Practice in Secondary Education | 5 |

For the Degree of Master of Science in the Teaching of Physics

| FIFTH YEAR | UNITS |
|---|---|
| Physics | 4 |
| Electives | 2 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Total | 8 |

For the Degree of Master of Science in the Teaching of the Physical Sciences

| FIFTH YEAR | UNITS |
|---|---|
| Physical Science | 4 |
| Electives | 2 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Total | 8 |

## Teacher Education Minor in Physics

| | HOURS |
|---|---|
| Physics 101 and 102, or 103 and 104—General Physics | 10 |
| Advanced Physics | 10 |
| Total | 20 |

## Curriculum Preparatory to the Teaching of Social Studies [1]

For the Degree of Bachelor of Arts in the Teaching of Social Studies

The courses outlined below total 129 to 139 hours. A minimum of 120 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. Desirable teaching combinations with social studies include art, commerce, English, French, German, home economics, industrial arts, Latin, mathematics, music, physical education, and Spanish.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three

[1] This is a specimen curriculum and may be varied with the advice of the adviser. However, all of the courses listed in the curriculum must be taken at some point in the student's schedule.

weeks of the fall semester. Application forms may be obtained in the Office of Studer Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 17 TO 19 HOURS |
|---|---|
| D.G.S. 121—History of Civilization[1] | 4 |
| Foreign Language[2] | 4 |
| Hygiene 101—Health Lectures | 2 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Science or Mathematics | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 17 TO 19 HOUI |
|---|---|
| D.G.S. 122—History of Civilization[1] | |
| Foreign Language[2] | |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or |
| Science or Mathematics | |
| Physical Education | |
| Military (men) | |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| Ed. 101—The Nature of the Teaching Profession[3] | 2 |
| Foreign Language | 4 |
| Pol. Sci. 150—American Government | 3 |
| Social Studies[4] | 6 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOUI |
|---|---|
| Foreign Language | |
| Hist. 152—History of the United States, 1865-1952 | |
| Social Studies[4] | |
| Physical Education | |
| Military (men) | |
| Electives | |

| THIRD YEAR | 17 HOURS |
|---|---|
| Psych. 100—Introduction to Psychology | 4 |
| Science or Mathematics | 3 |
| Social Studies[4] | 5 |
| Speech 101—Principles of Effective Speaking[5] | 3 |
| Electives | 2 |

| | 16 to 18 HOUI |
|---|---|
| Any of the following:[6] | |
| D.G.S. 161—Literature and Fine Arts | |
| Engl. 101—Introduction to Poetry | |
| Phil. 102—Logic | |
| Ed. 201—Foundations of American Education | |
| Ed. 240—Principles of Secondary Education | |
| Social Studies[4] | |
| Electives | 2 or |

Semesters of the fourth year are interchangeable.

| FOURTH YEAR | 15 OR 16 HOURS |
|---|---|
| Any of the following:[6] | |
| D.G.S. 162—Literature and Fine Arts | 4 |
| Engl. 102—Introduction to Drama | 3 |
| Phil. 321—Ethics and Value Theory | 3 |
| Social Studies[4] | 9 |
| Electives | 3 |

| | 14 OR 15 HOUI |
|---|---|
| Ed. 211—Educational Psychology | |
| Ed. 241—Technic of Teaching in the Secondary School | |
| Ed. 242—Educational Practice in Secondary Education | |
| Electives | 2 or |

[1] Students may substitute Hist. 111 and 112, 131 and 132, or 181 and 182.

[2] A student who has completed two years of foreign language in high school may register in secon year University courses in that language.

[3] May be taken first or second semester.

[4] The social studies requirement is twenty hours in history and twenty-one hours in social studi other than history. Hist. 151 may be taken to complete the Hist. 151-152 sequence. Students a also required to complete twelve to fourteen hours in advanced courses in history. In these, at lea six hours must be offered in American history and at least six hours in European history (ancien medieval, English, or modern). In the social studies fields other than history, the twenty-one hou of work should include at least one course in each of the following: economics, geography, politic science, sociology. At least eight hours should be taken in each of two social studies fields: economic geography, political science, sociology.

[5] Students who take D.G.S. 111 and 112 in their freshman year are not required to take Speech 10

[6] Second-year foreign language courses may be used to satisfy this requirement.

For the Degree of Master of Arts in the Teaching of Social Studies

| FIFTH YEAR | UNITS |
|---|---|
| Social Studies selected from not more than three of the following: economics, geography, history (at least two units), philosophy, political science, sociology | 4 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Ed. 456—Curriculum Problems and Trends in Specialized Fields of Secondary Education | 1 |
| Electives | 1 |
| Total | 8 |

## Teacher Education Minors in the Social Studies

### Other Than History

For a minor in the social studies, other than history, a student must complete at least eight hours of work in each of two of the following subjects: economics, geography, political science, sociology. The minimum total required for a minor is sixteen hours.

All, or nearly all, students who earn this teaching minor will have earned teaching majors in the commercial subjects, which require eleven hours of economics, three of political science, three of economic or commercial geography, and eight of sociology. These courses satisfy the minimum requirement for teaching civics, community civics, economics, sociology, contemporary problems, and economic or commercial geography in the high school.

### Minor in History

For a minor in history, a student must complete five to six hours in advanced courses in American history, eight hours in general European history, and two or three hours in one of the following: English, ancient, medieval, or Latin-American history. The minimum total required for a minor is sixteen hours.

## Curriculum Preparatory to the Teaching of Spanish

For the Degree of Bachelor of Arts in the Teaching of Spanish

A minimum of 123 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Copies of a sample curriculum in mimeographed form are available at 218 Lincoln Hall and at 105 Gregory Hall. All programs must include the courses listed below.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three week of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| | HOUR |
|---|---|
| Education | 1 |
| Ed. 101—The Nature of the Teaching Profession | 2 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 211—Educational Psychology | 3 |
| Ed. 240—Principles of Secondary Education | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| (Ed. 211, 241, and 242 are to be taken concurrently.) | |
| General Education | 1 |
| Sixteen hours are required in approved sequences from at least two of the following areas: biological science, physical science, social science. (See list of approved sequences under the general curriculum in Liberal Arts and Sciences.) | |
| Hist. 152—History of the United States, 1865-1952 | |
| Hygiene 101—Health Lectures | |
| Military (men) | |
| Physical Education | |
| Pol. Sci. 150—American Government | |
| Psych. 100—Introduction to Psychology | |
| Rhetoric and Speech | 8 or |
| Rhet. 101-102—Rhetoric and Composition; Speech 101—Principles of Effective Speaking, or Speech 141—Oral Interpretation of Literature | 9 |
| or D.G.S. 111-112—Verbal Communication | 8 |
| Teachers' Major in Spanish | 4 |
| Spanish 101-102—Elementary Spanish | 8 |
| Spanish 103-104—Intermediate Spanish | 8 |
| Spanish 201-202—Introduction to Spanish Literature | 6 |
| Spanish 211-212—Intermediate Composition and Conversation | 6 |
| Spanish 215—Spoken Spanish | 4 |
| Spanish 280—Teachers' Course | 2 |
| Spanish 331—Hispánica: España | 2 |
| Spanish 351—Phonetics, and Spanish 352—Syntax | 4 |
| Soc. Sci. 101 or 102—Latin-American Civilization | 3 |
| Teachers' Minor | at least 1 |
| Minor teaching subjects which constitute desirable combinations with Spanish include English, Latin, and history. | |
| Electives | 11 or 1 |
| Recommended electives are art, English, history, music, rhetoric, and Spanish. | |
| Total | at least 12 |

For the Degree of Master of Arts in the Teaching of Spanish

The exact character of the work in the fifth year will be determined by the particular experience and needs of the individual student. Each program will be worked out in individual conferences between the adviser in the major field and the student.

| FIFTH YEAR | UNIT |
|---|---|
| Spanish (middle group courses, one to two units; graduate courses, two to three units) | 4 |
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | 2 |
| Total | 8 |

## Teacher Education Minor in Spanish

| | HOURS |
|---|---|
| Spanish 101-102—Elementary Spanish | 8 |
| Spanish 103-104—Intermediate Spanish | 8 |
| Spanish 113-114—Elementary Composition and Conversation | 6 |
| Total | 22 |

## Curriculum Preparatory to the Teaching of Speech

For the Degree of Bachelor of Arts in the Teaching of Speech

This program is designed to give the teacher a foundation in three areas of instruction: public speaking, theater arts, and remedial speech. The courses outlined below total 132 to 138 hours. A minimum of 128 hours of credit, not counting the first two years of work in military and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 TO 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Rhet. 101—Rhetoric and Composition, or D.G.S. 111—Verbal Communication | 3 or 4 |
| Science or Mathematics[2] | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[3] | 2 |

| SECOND SEMESTER | 16 TO 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Hygiene 101—Health Lectures | 2 |
| Rhet. 102—Rhetoric and Composition, or D.G.S. 112—Verbal Communication | 3 or 4 |
| Science or Mathematics[2] | 3 |
| Speech 141—Oral Interpretation of Literature | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 16 OR 17 HOURS |
|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 |
| English Literature Elective[4] | 3 |
| Foreign Language[1] | 4 |
| Pol. Sci. 150—American Government | 3 |
| Speech 161—Fundamentals of Acting | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| | 17 OR 18 HOURS |
|---|---|
| Foreign Language[1] | 4 |
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Speech 117—Argumentation | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 2 |

[1] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[2] Six semester hours of natural science are required. The courses in biological science and physical science in the Division of General Studies are especially recommended.

[3] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours. In addition, beginning teachers of speech may need to complete a second teaching minor of sixteen semester hours.

[4] The following courses in English literature are especially recommended: Engl. 101, 102, 131, 281; Rhet. 246.

| THIRD YEAR | 16 HOURS |
|---|---|
| English Literature Elective[1] | 3 |
| Speech 157—Elements of Stagecraft | 4 |
| Speech 301—Introduction to Phonetics | 3 |
| Electives | 6 |

| | 18 HOUR |
|---|---|
| Ed. 240—Principles of Secondary Education | |
| Ed. 201—Foundations of American Education | |
| English Literature Elective[1] | |
| Speech 221—Persuasion | |
| Electives | |

| FOURTH YEAR | 17 HOURS |
|---|---|
| Speech 208—Classroom Problems in Speech Correction | 3 |
| Speech 255—Play Directing | 3 |
| Speech 375—Speech Science | 3 |
| Electives | 8 |

| | 16 HOUR |
|---|---|
| Ed. 211—Educational Psychology | |
| Ed. 242—Educational Practice in Secondary Education[2] | |
| Speech 247—Teaching of Speech[2] | |
| Electives | |

For the Degree of Master of Arts in the Teaching of Speech

## Public Speaking

| FIFTH YEAR | 4 UNITS |
|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Speech 423—The Rhetoric of Aristotle | 1 |
| Speech Elective | 1 |
| Electives | 1 |

| | 4 UNIT |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| One and one-half units chosen from the following: | 1½ |
| Speech 311—British Public Address | |
| Speech 312—American Public Address | |
| Speech 321—Modern Rhetorical Theory from 1700 to 1890 | |
| Speech 322—Modern Rhetorical Theory from 1890 to the Present | ½ |
| Electives | 1 |

## Theater Arts

| FIFTH YEAR | 4 UNITS |
|---|---|
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Speech 361—History of the European Theater to the Renaissance, or Speech 362—History of the European Theater from the Renaissance to 1900, or Speech 366—Development of the American Theater | 1 |
| Speech 451—Problems in Play Directing in the School Theater | 1 |
| Electives[3] | 1 |

| | 4 UNITS |
|---|---|
| Two of the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Speech 352—Theories of Play Production | 1 |
| Speech 452—Problems in Play Production in the School Theater | 1 |
| Electives[3] | 1 |

[1] The following courses in English literature are especially recommended: Engl. 101, 102, 131, 281; Rhet. 246.

[2] May be taken during the first semester.

[3] Recommended electives are advanced courses in speech; Engl. 215, 281, 335, 336, 431.

## Teacher Education Minor in Speech

| | HOURS |
|---|---|
| Speech 101—Principles of Effective Speaking | 3 |
| Speech 117—Argumentation | 3 |
| Speech 141—Oral Interpretation of Literature | 3 |
| Speech 161—Fundamentals of Acting | 3 |
| Speech 204—Fundamentals of Speech for Teachers of English | 3 |
| Speech 301—Introduction to Phonetics | 3 |
| Total | 18 |

## Curriculum Preparatory to Speech Correction Work

For the Degree of Bachelor of Science in Speech Correction

The courses outlined below total 136 to 140 hours. A minimum of 128 semester hours of credit, not counting the first two years of military and physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 17 OR 18 HOURS |
|---|---|
| Physiol. 103—Introduction to Human Physiology[1] | 4 |
| Rhet. 101—Rhetoric and Composition[2] | 3 |
| Speech 105—Voice and Articulation | 2 |
| Language[3] | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives[4] | 3 |

| SECOND SEMESTER | 17 OR 18 HOURS |
|---|---|
| Hygiene 101—Health Lectures | 2 |
| Language[3] | 4 |
| Psych. 103—Human Behavior[1] | 4 |
| Rhet. 102—Rhetoric and Composition[2] | 3 |
| Speech 102—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

[1] Chem. 101, Zool. 101, D.G.S. 131-132 or 141-142 may be chosen. Psych. 103 will be accepted in lieu of Psych. 100.

[2] In lieu of Rhet. 101 and 102 in the first year, followed by Speech 101 or 141 later, the student may elect D.G.S. 111-112 for four hours of credit each semester of the first year.

[3] A reading knowledge of a foreign language (French, German, Greek, Italian, Latin, Portuguese, or Spanish) equivalent to that resulting from four semesters of study of a foreign language commenced in college is required. This requirement is satisfied by passing French 104, German 104 or 144, Greek 202, Italian 104, Latin 104, Portuguese 104, Spanish 104, or a more advanced course in any of these languages. No credit toward graduation is given for a beginning course in a foreign language unless it is continued through a full year. Completion of the second year of a foreign language will satisfy the graduation requirement if the same foreign language is pursued in the University as is offered for entrance.

[4] Electives recommended are Speech 111, 117, 141, or another course approved by the adviser.

| SECOND YEAR | 15 OR 16 HOURS | 16 OR 17 HOURS |
|---|---|---|
| Ed. 101—The Nature of the Teaching Profession | 2 | |
| English[1] | 3 | 3 |
| Hist. 152—History of the United States, 1865-1952 | | 3 |
| Pol. Sci. 150—American Government | 3 | |
| Physiol. 106—Physiology of the Nervous System and the Special Senses | | 3 |
| Sociol. 100—Principles of Sociology[2] | 3 | |
| Sociol. 110—Social Factors in Personality[2] | | 3 |
| Physical Education | 1 | 1 |
| Military (men) | 1 | 1 |
| Electives[3] | 3 | 3 |

| THIRD YEAR | 18 HOURS | 18 HOURS |
|---|---|---|
| Ed. 201—Foundations of American Education | | 2 |
| Ed. 218—Remedial Reading in the Elementary School, or Ed. 219—Remedial Reading in the High School | 3 | |
| Ed. 230—Principles of Elementary Education | | 2 |
| Ed. 236—Child Development for Elementary Teachers | 3 | |
| Ed. 237—Child Development for Elementary Teachers | | 3 |
| Speech 301—Introduction to Phonetics | 3 | |
| Ed. 317—Education of Exceptional Children | | 3 |
| Speech 375—Speech Science | 3 | |
| Speech 376—Speech Science | | 3 |
| Speech 391—Introduction to Hearing Disorders | 3 | |
| Speech 393—Aural Rehabilitation | | 3 |
| Electives[4] | 3 | 2 |

| FOURTH YEAR | 18 HOURS | 17 HOURS |
|---|---|---|
| Ed. 220—Educational Practice in the Education of Exceptional Children | 3 | |
| Ed. 220—Educational Practice in the Education of Exceptional Children | | 3 |
| Ed. 324—Mental and Educational Measurement of Exceptional Children | 3 | |
| Psych. 338—Abnormal Psychology, or Psych. 150—Character and Personality | | 3 |
| Speech 385—Speech Correction (with Laboratory) | 4 | |
| Speech 388—Speech Correction (with Laboratory) | | 4 |
| Speech 395—Audiometry and the Use of Hearing Aids | 3 | |
| Electives[4] | 5 | 7 |

### For the Degree of Master of Science in Speech Correction

This program is designed for teachers who have the degree of Bachelor of Science in Speech Correction at the University of Illinois or its equivalent at a recognized college or university, and who desire to obtain an advanced degree in speech correction.

Prerequisite for admission is the four-year curriculum preparatory to speech correction or its equivalent. Students who have not met all of the requirements of a four-year undergraduate curriculum but who desire to take the fifth year of work for a master's degree, may register on approval of the adviser, the Coordinator of Teacher Education, and the Dean of the Graduate College.

| FIFTH YEAR | UNITS |
|---|---|
| Four units of speech selected from the following: | |
| Speech 383—Psychological Disorders of Speech | 1 |
| Speech 387—Voice and Articulation Disorders | ½ or 1 |
| Speech 475—Experimental Phonetics I | 1 |
| Speech 476—Experimental Phonetics II | 1 |
| Speech 481—Seminar in Voice and Articulation Disorders | 1 |

[1] At least six semester hours of English are required. The following courses are recommended: Engl. 101, 102; 113, 114; 121, 122; 131.

[2] D.G.S. 151-152, Sociol. 104 and 105 may be chosen.

[3] Electives recommended are Speech 111, 117, 141, or another course approved by the adviser.

[4] Electives recommended are Lib. Sci. 303; S.W. 225, 226; P.E.W. 206; Psych. 135, 150; Home Econ. 205.

| | |
|---|---|
| Speech 483—Seminar in the Psychology of Speech Disorders | 1 |
| Speech 486—Advanced Clinical Techniques in Speech and Hearing | 1 |
| Speech 488—Diagnosis of Speech Disorders | 1 |
| Speech 489—Seminar in Organic Speech Disorders | 1 |
| Speech 493 and 494—Research in Special Topics | 1 or 2 |
| Two units of education: | |
| One unit from the following: | |
| Ed. 301—Philosophy of Education | ½ |
| Ed. 302—History of American Education | ½ |
| Ed. 303—Comparative Education | ½ |
| Ed. 304—Social Foundations of Education | ½ |
| Ed. 311—Psychology of Learning for Teachers | ½ |
| Ed. 312—Mental Hygiene and the School | ½ |
| Electives | 2 |
| Total | 8 |

The Library School reading room.

# Library School

Although the Library School is a graduate professional school, a series of courses at the undergraduate level is offered by it through the College of Liberal Arts and Sciences and through the College of Education. These courses may be taken as a minor in either of these colleges and serve two purposes: (a) to give the student instruction in the fundamental principles and practices of librarianship, providing the basic preparation for his advanced professional studies in the fifth year, and (b) to give prospective school librarians the basic preparation necessary to meet certification requirements for school library work.

### LIBRARY SCIENCE AS A MINOR IN THE COLLEGE OF LIBERAL ARTS AND SCIENCES

The purpose of this curriculum is to give the student a broad liberal education, a strong subject specialization, and instruction in the fundamental practices of librarianship providing the basic preparation for his advanced professional studies in the Library School. It should also provide him with an understanding of the nature and possibilities of library service and form the basis for his professional development.

Because of the variety of opportunities in library service, the Library School will admit students with many kinds of undergraduate specialization. A good general education such as represented in the Division of General Studies or the general curriculum is a fundamental requirement. Foreign languages, literature, history, the social sciences, and the natural sciences are all important for the prospective librarian. It is especially recommended that the student include in his program of studies at least one course in each of the following subjects: sociology, psychology, education, American government, public administration, and economics.

The knowledge of foreign languages which the student should acquire before entering the Library School varies with the type of library work in which he is interested. In some fields, such as school library service, foreign languages are relatively unimportant. For bibliographical work, reference, cataloging, and most types of work in college, university, and other scholarly libraries, a reading knowledge of two modern foreign languages, preferably French and German, is essential.

The Associate Director of the Library School will be glad to answer any inquiries from students who choose library science as a minor regarding the type of preprofessional education best suited to their particular needs and interests.

Each student who chooses library science as a minor must complete twenty hours of library science as follows:

| THIRD YEAR — FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| Lib. Sci. 201—Use of Books and Libraries | 3 | Lib. Sci. 204—Organization and Operation of Libraries I | 3 |
| **FOURTH YEAR** | | | |
| Lib. Sci. 255—Organization and Operation of Libraries II | 3 | Lib. Sci. 258—Selection of Library Materials | 3 |
| | | Lib. Sci. 308—Audio-Visual Services in Libraries | 2 |

To complete the minor requirement of twenty semester hours, two courses should be chosen from the following courses in the 300 series on the basis of the student's interest: Lib. Sci. 301, Literature of the Humanities and Social Sciences; Lib. Sci. 302, Literature of Science and Technology; Lib. Sci. 303, Library Materials for Children; and Lib. Sci. 304, Library Materials for Adolescents.

### LIBRARY SCIENCE AS A MINOR IN THE COLLEGE OF EDUCATION

The Library School offers courses for those advanced undergraduates in the College of Education who wish to qualify as school-librarians in small schools. The Library School also offers full professional training leading to a master's degree in library science for students preparing for positions in large schools and for supervisory positions in the school library field.

Students may apply the following undergraduate preparatory courses toward the state library science requirement for librarians in small schools. These courses are also prerequisites for admission to the graduate professional program in library science.

| FIRST SEMESTER | 9 HOURS | SECOND SEMESTER | 11 HOURS |
|---|---|---|---|
| Lib. Sci. 201—Use of Books and Libraries | 3 | Lib. Sci. 204—Organization and Operation of Libraries I | 3 |
| Lib. Sci. 255—Organization and Operation of Libraries II | 3 | Lib. Sci. 258—Selection of Library Materials | 3 |
| Lib. Sci. 303—Library Materials for Children | 3 | Lib. Sci. 304—Library Materials for Adolescents | 3 |
| | | Lib. Sci. 308—Audio-Visual Services in Libraries | 2 |

Concurrently with these courses, it is recommended that students preparing for school-library positions also take the library sections of Ed. 241, Technic of Teaching in the Secondary School, and Ed. 242, Educational Practice in Secondary Education, thus giving them practice work in a recognized school library.

### GRADUATE WORK

For information about the graduate programs in library science, see the announcements of the Library School and the Graduate College, or write to the Associate Director of the Library School, 331 Library, Urbana, Illinois.

Social recreation class for men and women.

# School of Physical Education

The School of Physical Education offeres a service program in physical education as well as professional training curricula leading to the degrees of Bachelor of Science in Physical Education, in Health Education, and in Recreation. Advanced courses leading to the degrees of Master of Science in Health Education and in Physical Education and Doctor of Philosophy in Physical Education are offered in the Graduate College.

All students entering the University as freshmen (except veterans who are excused, but who may elect to take physical education) are required to obtain four hours of credit in physical education. Credit may be obtained by passing courses in physical education or by passing proficiency examinations which are offered at specified times by the department. Students assigned to prescribed exercise or basic physical fitness courses are not permitted to take proficiency examinations.

The service programs offered both men and women include a wide variety of courses designed to meet varying needs of the students. The chief purposes of these programs are correcting and ameliorating handicapping defects; developing fundamental motor abilities; developing organic power; teaching recreational sports for life use; developing an appreciation of physical fitness and sports.

The Athletic Association, closely affiliated with the School of Physical Education, sponsors numerous programs of intercollegiate and intramural sports for undergraduate men and other recreational sports for students and members of the faculty.

The Department of Physical Education for Women conducts an extensive program of intramural sports for women. Students are organized in voluntary inter-class and inter-house teams in hockey, soccer, bowling, basketball, volleyball, apparatus, swimming, baseball, and track and field athletics.

## Curriculum in Health Education

### For the Degree of Bachelor of Science in Health Education

This curriculum is open to both men and women. A minimum of 130 hours of credit, counting physical education and the first two years of work in military training, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR — FIRST SEMESTER | 14 TO 17 HOURS |
|---|---|
| Chem. 101 or 102—General Chemistry | 5 or 3 |
| D.G.S. 111—Verbal Communication | 4 |
| D.G.S. 131—Biological Science | 4 |
| P.E.M. or P.E.W. 150—Professional Orientation | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND SEMESTER | 14 OR 15 HOURS |
|---|---|
| Chem. 132—Elementary Organic Chemistry | 3 |
| D.G.S. 112—Verbal Communication | 4 |
| D.G.S. 132—Biological Science | 4 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| Physical Education | 1 |
| Military (men) | 1 |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Home Econ. 120—Elementary Nutrition | 2 |
| Hygiene 110—Public Health | 2 |
| Physiol 104—Physiological Anatomy | 5 |
| Pol. Sci. 150—American Government | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Humanities Elective | 2 |
| Electives[1] | 2 |

| | 17 OR 18 HOURS |
|---|---|
| Hist. 152—History of the United States, 1865-1952 | 3 |
| Physiol. 105—Physiological Anatomy | 5 |
| Psych. 100—Introduction to Psychology | 4 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 4 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Bact. 104—Elementary Bacteriology | 5 |
| H.E. 280—Safety Education | 2 |
| H.E. 281—First Aid | 2 |
| H.E. 282—Organization of School Health Programs | 3 |
| S.W. 225—Introduction to Social Work I | 3 |
| Electives | 2 |

| | 17 HOURS |
|---|---|
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| H.E. 283—Physical and Health Inspection | 2 |
| H.E. 284—Driver Education | 2 |
| P.E.M. or P.E.W. 208—Theory of Prescribing Exercise | 3 |
| P.E.M. or P.E.W. 210—Inspection Trip | 0 |
| S.W. 226—Introduction to Social Work II | 3 |
| Electives | 3 |

| FOURTH YEAR | 15 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 |
| Ed. 242—Educational Practice in Secondary Education | 5 |
| H.E. 288—Principles of Health Education | 3 |

| | 15 HOURS |
|---|---|
| H.E. 287—Field Work in Community Health | 2 |
| P.E.M. or P.E.W. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| Psych. 283—Psychology of Adjustment | 4 |
| Electives | 6 |

### For the Degree of Master of Science in Health Education

The admission requirements to the graduate program in health education include a minimum grade-point average of 3.5 for all courses taken during the last two years of undergraduate study; thirty semester hours of approved undergraduate credit in health education or closely related courses; twenty-four semester hours of approved undergraduate credit in science; sixteen semester hours of undergraduate credit in education; and a course in tests and measurements or statistics. Students are not admitted on limited status.

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) health education or approved physical education courses, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Educa-

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen semester hours.

tion, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of H.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis in health education, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in health education.

| FIFTH YEAR | UNITS |
|---|---|
| H.E. 400—Scientific Foundations of Health Education | 1 |
| H.E. 401—Problems in Health Education | 1 |
| H.E. 402—Problems in Safety Education | 1 |
| H.E. 403—Problems in Public Health | 1 |
| H.E. 404—Trends and Issues in Social Hygiene | 1 |
| H.E. 490—Seminar | 0 |
| H.E. 491—Thesis | 1 to 2 |

## Teacher Education Minor in Health Education

| | HOURS |
|---|---|
| H.E. 280—Safety Education | 2 |
| H.E. 281—First Aid | 2 |
| H.E. 282—Organization of School Health Programs | 3 |
| H.E. 283—Physical and Health Inspection | 2 |
| H.E. 287—Field Work in Community Health | 2 |
| H.E. 288—Principles of Health Education | 3 |
| Home Econ. 120—Elementary Nutrition | 2 |
| Hygiene 110—Public Health | 2 |
| Total | 18 |

## Curriculum in Recreation

For the Degree of Bachelor of Science in Recreation

This curriculum is open to both men and women. A minimum of 130 hours of credit, counting physical education and the first two years in military, is required for graduation. Students are required to complete one minor consisting of a minimum of sixteen hours.

| FIRST YEAR FIRST SEMESTER 16 OR 17 HOURS | |
|---|---|
| Men | |
| P.E.M. 154—Swimming | 2 |
| Military | 1 |
| Women | |
| P.E.W. 110, 111, or 112—Swimming | 1 |
| P.E.W. 151—Body Mechanics and Gymnastics | 1 |
| Electives | 2 |
| D.G.S. 131—Biological Science | 4 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| P.E.M. or P.E.W. 150—Professional Orientation | 2 |
| P.E.M. or P.E.W. 166—Games for Children | 2 |
| Rhet. 101—Rhetoric and Composition | 3 |

| SECOND SEMESTER 16 OR 17 HOURS | |
|---|---|
| Men | |
| Rec. 170—Outdoor Recreational Sports | 2 |
| Rec. 171—Indoor Recreational Sports | 2 |
| Physical Education | 1 |
| Military | 1 |
| Women | |
| P.E.W. 135—Archery | 1 |
| P.E.W. 152—Basketball and Softball | 1 |
| Electives | 3 |
| Art 170—Recreational Crafts | 2 |
| D.G.S. 132—Biological Science | 4 |
| Hygiene 110—Public Health | 2 |
| Rhet. 102—Rhetoric and Composition | 3 |

| SECOND YEAR | 17 OR 18 HOURS |
|---|---|
| Music 130—Recreational Music | 2 |
| Rec. 174—Camp Counseling | 3 |
| Rec. 176—Principles of Recreation | 3 |
| Rec. 270—Social Recreation | 2 |
| Sociol. 100—Principles of Sociology | 3 |
| Physical Education | 1 |
| Military (men) | 1 |
| Electives | 3 |

| | 15 OR 16 HOURS |
|---|---|
| H.E. 281—First Aid | 2 |
| Pol. Sci. 150—American Government | 3 |
| Psych. 100—Introduction to Psychology | 4 |
| Rec. 272—Organization of Aquatic Programs | 2 |
| Speech 101—Principles of Effective Speaking | 3 |
| Physical Education | 1 |
| Military (men) | 1 |

| THIRD YEAR | 17 HOURS |
|---|---|
| Dance 235—Square and Ballroom Dance | 2 |
| Ed. 211—Educational Psychology | 3 |
| Rec. 235—Design of Recreational Areas | 2 |
| Rec. 274—Introduction to Outdoor Education and Recreation | 3 |
| Speech 203—Dramatics for Teachers | 3 |
| Electives | 4 |

| | 16 HOURS |
|---|---|
| P.E.M. or P.E.W. 210—Inspection Trip | 0 |
| Rec. 271—Organization of Sports Programs | 3 |
| Rec. 273—Recreation in Rural Areas | 2 |
| Sociol. 375—Sociology of the Community | 3 |
| Electives | 8 |

| FOURTH YEAR | 17 HOURS |
|---|---|
| L.A. 271—Planning of Towns and Cities | 2 |
| Rec. 275—Organization of Recreation Programs | 3 |
| Rec. 278—Recreation Field Work | 3 |
| S.W. 225—Introduction to Social Work I | 3 |
| Electives | 6 |

| | 15 HOURS |
|---|---|
| P.E.M. or P.E.W. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| Pol. Sci. 361—Introduction to Public Administration | 3 |
| Rec. 279—Recreation Field Work | 3 |
| Electives | 6 |

## Curriculum in Physical Education for Men

For the Degree of Bachelor of Science in Physical Education

A minimum of 130 hours of credit, counting physical education and the first two years in military, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 17 HOURS |
|---|---|
| Hygiene 104—Personal and Community Hygiene | 2 |
| P.E.M. 150—Professional Orientation | 2 |
| P.E.M. 151—Beginning Basketball | 2 |
| P.E.M. 152—Beginning Football | 2 |
| Physiol. 104—Physiological Anatomy | 5 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Military | 1 |

| SECOND SEMESTER | 18 HOURS |
|---|---|
| Hygiene 110—Public Health | 2 |
| P.E.M. 153—Physical Conditioning Programs | 2 |
| P.E.M. 154—Swimming | 2 |
| Physiol. 105—Physiological Anatomy | 5 |
| Speech 101—Principles of Effective Speaking | 3 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Military | 1 |

| SECOND YEAR | 16 HOURS | | 17 HOURS |
|---|---|---|---|
| Hist. 152—History of the United States, 1865-1952 | 3 | Psych. 100—Introduction to Psychology | 4 |
| P.E.M. 155—Gymnastics | 2 | Rec. 170—Outdoor Recreational Sports | 2 |
| P.E.M. 156—Track and Field | 2 | Rec. 171—Indoor Recreational Sports | 2 |
| Rec. 174—Camp Counseling | 3 | Rec. 176—Principles of Recreation | 3 |
| Military | 1 | Military | 1 |
| Humanities Elective | 2 | Teaching Minor | 5 |
| Teaching Minor[1] | 3 | | |

| THIRD YEAR | 16 HOURS | | 16 HOURS |
|---|---|---|---|
| H.E. 280—Safety Education | 2 | Ed. 201—Foundations of American Education | 2 |
| H.E. 281—First Aid | 2 | Ed. 240—Principles of Secondary Education | 2 |
| Pol. Sci. 150—American Government | 3 | H.E. 282—Organization of School Health Programs | 3 |
| Teaching Minor | 3 | P.E.M. 210—Inspection Trip | 0 |
| Electives | 6 | Teaching Minor | 3 |
| | | Electives | 6 |

| FOURTH YEAR | 15 HOURS | | 15 HOURS |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | P.E.M. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 | P.E.M. 206—Kinesiology | 3 |
| Ed. 242—Educational Practice in Secondary Education | 5 | Teaching Minor | 4 |
| P.E.M. 204—Organization of Physical Education | 3 | Electives | 5 |

### For the Degree of Master of Science in Physical Education

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) physical education or related courses, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Education, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of P.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in physical education.

Graduate students who choose physical education as a minor must present twenty hours of credit in approved undergraduate work in physical education (candidates with experience in physical education or allied fields may receive partial credit toward admission up to a maximum of eight hours) and twelve hours of credit in approved undergraduate work in science. At least two units of satisfactory credit in physical education must be completed for a minor.

| FIFTH YEAR | UNITS |
|---|---|
| P.E. 401—Problems in Physical Education | 1 |
| P.E. 406—Philosophy of Sport | 1 |
| P.E. 407—Sports Psychology | 1 |
| P.E. 450—Trends and Technics in Rehabilitation | 1 |

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen hours.

P.E. 451—Scientific Foundations of Physical Fitness ..... 1
P.E. 452—Scientific Analysis of Physical Education Activities ..... 1
P.E. 453—Anthropometrical and Body Mechanics Research Technics in Health and Physical Education ..... 1
P.E. 490—Seminar ..... 0
P.E. 491—Thesis ..... ½ to 4
P.E. 493-494—Research ..... ½ to 2
P.E. 495—Technics of Research in Health, Physical Education, and Recreation ..... 1

## Teacher Education Minor in Physical Education for Men

| | HOURS |
|---|---|
| H.E. 281—First Aid | 2 |
| P.E.M. 204—Organization of Physical Education | 3 |
| Rec. 271—Organization of Sports Programs | 3 |
| Eight hours in physical education activity courses other than the service courses | 8 |
| Total | 16 |

## Curriculum in Physical Education for Women

For the Degree of Bachelor of Science in Physical Education

A minimum of 130 hours of credit, counting physical education, is required for graduation.

Applications for student teaching are accepted twice each year. Students who are on the campus during the spring semester prior to the year they expect to enroll in student teaching must apply for admission to Educational Practice during February of that semester. Students who are not on the campus during the spring semester prior to the year they expect to enroll in student teaching are allowed to apply during the first three weeks of the fall semester. Application forms may be obtained in the Office of Student Teaching, 208 Gregory Hall.

| FIRST YEAR FIRST SEMESTER | 16 OR 17 HOURS |
|---|---|
| D.G.S. 131—Biological Science | 4 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| P.E.W. 110, 111, or 112—Swimming | 1 |
| P.E.W. 150—Professional Orientation | 2 |
| P.E.W. 151—Body Mechanics and Gymnastics | 1 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Humanities Electives[1] | 3 or 4 |

| SECOND SEMESTER | 16 HOURS |
|---|---|
| Dance 160—Beginning Contemporary Dance | 1 |
| D.G.S. 132—Biological Science | 4 |
| P.E.W. 152—Basketball and Softball | 1 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Electives | 4 |

| SECOND YEAR | 17 HOURS |
|---|---|
| Dance 163—Analysis of Rhythmic Movement | 2 |
| Ed. 236—Child Development for Elementary Teachers | 3 |
| P.E.W. 153—Soccer and Volleyball | 1 |
| Physiol. 104—Physiological Anatomy | 5 |
| Psych. 100—Introduction to Psychology | 4 |
| Electives | 2 |

| | 17 OR 18 HOURS |
|---|---|
| Hist. 152—History of the United States, 1865-1952 | 3 |
| P.E.W. 154—Tumbling and Apparatus | 1 |
| P.E.W. 155—Bowling and Tennis | 1 |
| P.E.W. 166—Games for Children | 2 |
| Physiol. 105—Physiological Anatomy | 5 |
| Social Science Electives[2] | 3 or 4 |
| Electives | 2 |

[1] Recommended humanities electives: D.G.S. 121, 122; Engl. 101, 102; foreign language.

[2] Recommended social science electives: D.G.S. 151 and 152, or Sociol. 104 and 105; Geog. 104; Hist. 111, 112, 131, 132.

| THIRD YEAR | 16 HOURS |
|---|---|
| Dance 235—Square and Ballroom Dance | 2 |
| H.E. 281—First Aid | 2 |
| P.E.W. 200—Speedball and Hockey | 1 |
| P.E.W. 206—Kinesiology | 3 |
| P.E.W. 213—Teaching of Sports | 4 |
| Social Science Electives[1] | 4 |

| | 16 OR 17 HOURS |
|---|---|
| Dance 236—Folk Dance | 1 |
| Ed. 201—Foundations of American Education | 2 |
| Ed. 240—Principles of Secondary Education | 2 |
| P.E.W. 208—Theory of Prescribing Exercise | 3 |
| P.E.W. 210—Inspection Trip | 0 |
| P.E.W. 214—Teaching of Sports | 4 |
| Electives | 4 or 5 |

| FOURTH YEAR | 17 HOURS |
|---|---|
| Ed. 211—Educational Psychology | 3 |
| Ed. 232—Educational Practice in Elementary Education | 3 |
| Ed. 241—Technic of Teaching in the Secondary School | 4 |
| Ed. 242—Educational Practice in Secondary Education | 3 |
| P.E.W. 201—Badminton | 1 |
| P.E.W. 204—Organization of Physical Education | 3 |

| | 15 HOURS |
|---|---|
| H.E. 282—Organization of School Health Programs | 3 |
| P.E.W. 202—Archery and Golf | 1 |
| P.E.W. 205—Tests and Measurements in Health, Physical Education, and Recreation | 3 |
| Pol. Sci. 150—American Government | 3 |
| Rec. 270—Social Recreation Activities | 2 |
| Electives | 3 |

**SUMMARY**

| | HOURS |
|---|---|
| Physical Education, Dance, and Recreation Courses, as prescribed | 41 |
| General Courses, as prescribed | 29 to 31 |
| Biological Science Teaching Minor,[2] as prescribed | 25 |
| Education Courses, as prescribed | 20 |
| Electives | 15 or 16 |
| Total | 130 |

For the Degree of Master of Science in Physical Education

Graduation requirements for this degree are eight units (equivalent to thirty-two semester hours) to include: (a) physical education or related courses, four units; (b) education, two units (Ed. 311—Psychology of Learning for Teachers, Ed. 312—Mental Hygiene and the School, and two of the following: Ed. 301—Philosophy of Education, Ed. 302—History of American Education, Ed. 303—Comparative Education, Ed. 304—Social Foundations of Education); (c) registration in and satisfactory completion of P.E. 490—Seminar, for one semester, without credit; (d) presentation of an acceptable thesis, two units.

Candidates may petition to waive the thesis and seminar requirements. Those who are excused are required to secure two units' credit in lieu of thesis credit (item d) and in addition are required to take and pass a final comprehensive written examination in physical education.

Graduate students who choose physical education as a minor must present twenty hours of credit in approved undergraduate work in physical education (candidates with experience in physical education or allied fields may receive partial credit toward admission up to a maximum of eight hours) and twelve hours of credit in approved undergraduate work in science. At least two units of satisfactory credit in physical education must be completed for a minor.

[1] Recommended social science electives: D.G.S. 151 and 152, or Sociol. 104 and 105; Geog. 104; Hist. 111, 112, 131, 132.

[2] The biological science teaching minor includes D.G.S. 131 and 132, 8 hours; H.E. 281 and 282, 4 hours; Hygiene 101, 2 hours; Physiol. 104 and 105, 10 hours. Students may substitute Bot. 100 and Zool. 101, 9 hours, or Bot 100 and Zool. 104, 8 hours, for D.G.S. 131 and 132.

D.G.S. 131, 132, Bot. 100, Zool. 101 and 104 are not available at the Chicago Undergraduate Division. Transfer students from there who are getting a biological science minor may substitute Biol. 101 (4 hours) and 131 (5 hours).

| FIFTH YEAR | UNITS |
|---|---|
| P.E. 401—Problems in Physical Education | 1 |
| P.E. 406—Philosophy of Sport | 1 |
| P.E. 407—Sports Psychology | 1 |
| P.E. 450—Trends and Technics in Rehabilitation | 1 |
| P.E. 451—Scientific Foundations of Physical Fitness | 1 |
| P.E. 452—Scientific Analysis of Physical Education Activities | 1 |
| P.E. 453—Anthropometrical and Body Mechanics Research Technics in Health and Physical Education | 1 |
| P.E. 490—Seminar | ( |
| P.E. 491—Thesis | 4 |
| P.E. 493-494—Research | ½ to 2 |
| P.E. 495—Technics of Research in Health, Physical Education, and Recreation | |

## Teacher Education Minor in Physical Education for Women

| | HOURS |
|---|---|
| Dance 235—Square and Ballroom Dance | 2 |
| H.E. 282—Organization of School Health Programs | 2 |
| P.E.W. 120, 121, or 122—Hockey, Soccer, or Speedball | |
| P.E.W. 123 or 124—Basketball or Volleyball | |
| P.E.W. 125 or 134—Softball or Tennis | |
| P.E.W. 130, 132, or 135—Badminton, Bowling, or Archery | |
| P.E.W. 151—Body Mechanics and Gymnastics | |
| P.E.W. 166—Games for Children | 2 |
| P.E.W. 204—Organization of Physical Education | 2 |
| Rec. 270—Social Recreation Activities | |
| P.E.W. or Dance Electives | 2 |
| Total | 20 |

## Curriculum in Dance

For the Degree of Bachelor of Science in Physical Education

A minimum of 130 hours of credit, counting physical education, is required fo graduation.

Applications for student teaching are accepted twice each year. Students who ar on the campus during the spring semester prior to the year they expect to enroll in stu dent teaching must apply for admission to Educational Practice during February of tha semester. Students who are not on the campus during the spring semester prior to th year they expect to enroll in student teaching are allowed to apply during the first thre weeks of the fall semester. Application forms may be obtained in the Office of Studen Teaching, 208 Gregory Hall.

| FIRST YEAR — FIRST SEMESTER | 17 HOURS |
|---|---|
| Dance 160—Beginning Contemporary Dance | 1 |
| Engl. 101—Introduction to Poetry | 3 |
| Hygiene 104—Personal and Community Hygiene | 2 |
| Music 100—Rudiments of Theory | 2 |
| P.E.W. 150—Professional Orientation | 2 |
| P.E.W. 120, 121, 122, 123, 124, or 125 (Team Sport) | 1 |
| Rhet. 101—Rhetoric and Composition | 3 |
| Electives[1] | 3 |

| SECOND SEMESTER | 16 HOURS |
|---|---|
| Engl. 102—Introduction to the Drama | 3 |
| P.E.W. 110, 111, 112, or 113 (Swimming) | 1 |
| P.E.W. 130, 131, 132, 133, 134, or 135 (Individual Sport) | 1 |
| Rhet. 102—Rhetoric and Composition | 3 |
| Speech 101—Principles of Effective Speaking | 3 |
| Electives | 5 |

[1] Students are required to complete one teaching minor consisting of a minimum of sixteen semest hours.

| SECOND YEAR | 17 HOURS | | 17 HOURS |
|---|---|---|---|
| Dance 162—Advanced Contemporary Dance | 1 | Dance 164—Dance Composition | 2 |
| Dance 163—Analysis of Rhythmic Movement | 2 | Dance 236—Folk Dance | 1 |
| Hist. 152—History of the United States, 1865-1952 | 3 | Physiol. 105—Physiological Anatomy | 5 |
| Physiol. 104—Physiological Anatomy | 5 | Pol. Sci. 150—American Government | 3 |
| Speech 161—Fundamentals of Acting | 3 | Rec. 270—Social Recreation Activities | 2 |
| Electives | 3 | Electives | 4 |

| THIRD YEAR | 17 HOURS | | 16 HOURS |
|---|---|---|---|
| Dance 235—Square and Ballroom Dance | 2 | Dance 243—Creative Rhythms for Children | 2 |
| Dance 241—Percussion | 2 | Dance 244—Teaching of Dance | 3 |
| Dance 245—Dance Production Workshop | 3 | Ed. 201—Foundations of American Education | 2 |
| P.E.W. 206—Kinesiology | 3 | Ed. 240—Principles of Secondary Education | 2 |
| Psych. 100—Introduction to Psychology | 4 | P.E.W. 208—Theory of Prescribing Exercise | 3 |
| Electives | 3 | Speech 157—Elements of Stagecraft | 4 |

| FOURTH YEAR | 15 HOURS | | 15 HOURS |
|---|---|---|---|
| Ed. 211—Educational Psychology | 3 | Dance 240—Cultural Survey of Dance | 2 |
| Ed. 232—Educational Practice in Elementary Education | 3 | Dance 246—Theory and Philosophy of Dance | 2 |
| Ed. 241—Technic of Teaching in the Secondary School | 3 | Music 234—Musical Composition for Dance | 2 |
| Ed. 242—Educational Practice in Secondary Education | 3 | Phil. 101—Introduction to Philosophy | 3 |
| P.E.W. 204—Organization of Physical Education | 3 | Electives | 6 |

## Teacher Education Minor in Dance

| | HOURS |
|---|---|
| Dance 160—Beginning Contemporary Dance | 1 |
| Dance 161—Intermediate Contemporary Dance | 1 |
| Dance 162—Analysis of Rhythmic Movement | 2 |
| Dance 164—Dance Composition | 2 |
| Dance 235—Square and Ballroom Dance | 2 |
| Dance 236—Folk Dance | 1 |
| Dance 241—Percussion | 2 |
| Dance 243—Creative Rhythms for Children, or Dance 244—Teaching of Dance | 2 or 3 |
| Dance 245—Dance Production Workshop, or Dance 246—Theory and Philosophy of Dance | 3 |
| P.E.W.—Individual Sports, Team Sports, or Swimming | 3 or 4 |
| Total | 20 |

# School of Social Work

The School of Social Work offers a series of undergraduate courses intended to give the student a general orientation to the whole field of social work and some of its special settings. Areas discussed in these courses include family welfare, child welfare, social group work, community organization, and the public social services. The undergraduate social work courses may be counted toward a minor in combination with other social sciences.

The student preparing for a career in social work should, during his undergraduate years, obtain a good general education, including a concentration of courses in the social sciences. Carefully selected courses in the fields of sociology, economics, political science, psychology, and history should acquaint the student with the nature of social organization, motivations of human behavior, the economic order, and the functioning of the different levels of government. As skill in research is important to all social workers, a course in statistics should be included in the undergraduate program.

Recommended for all undergraduates interested in human welfare, the undergraduate courses in social work have proved especially useful for those who wish to explore the field of social work as a career before deciding on graduate study, and for those who will work with the handicapped or become ministers, teachers, or counselors in schools or industry. It is also helpful to the individual who will become a member of committees and boards of social, religious, and civic agencies.

While the undergraduate courses have not been made a requirement for entrance to the graduate program, they are recommended to all seniors intending to take professional training in social work.

Undergraduates may receive help with their academic plans by consulting faculty members of the School of Social Work.

Going to classes down the Broadwalk.

# Division of Special Services for War Veterans

The Division of Special Services for War Veterans was established to meet the varied needs of the men and women who served in the armed forces, the auxiliary services, or the merchant marine of the United States or its allies after September 15, 1940. It is the agency through which the University helps the veteran begin or continue his education. It is a pioneering educational venture breaking traditional educational policies and allowing for such educational freedom as will serve the best interests of the veteran.

The Division attempts to discover and to meet the needs of the returning veteran. It supplies information to the veteran on the various services of the University, and will at his request help him to obtain the benefits which have been offered to him by the state and the nation. It helps him determine his educational aims and assists him in attaining them. It aids him in making educational adjustments. It guides him in his search for the curriculum which will best satisfy his needs, and helps him in arranging for modifications which he desires and which will be accepted by the University.

A veteran whose previous training has not fitted him for admission to the curriculum of his choice may register in the Division, subject to the admission requirements, and may take such courses as will enable him to meet the requirements for admission to that curriculum and to transfer into it when he is adequately prepared to pursue it. A veteran from another school or college may request transfer to the Division in order to bypass certain curriculum requirements and obtain his degree.

The veteran may register in the Division of Special Services for War Veterans: if he so elects at the time of his registration and is accepted by the Division; if he is referred to the Division by any school or college, and is accepted; or if he voluntarily transfers to the Division from any school or college according to the usual University procedures.

### REQUIREMENTS FOR ADMISSION

If a veteran meets the entrance requirements of the University, he may then apply for admission into the Division.

1. He must have served in the armed forces, auxiliary services, or merchant marine of the United States or its allies after September 15, 1940.
2. He will not be reinstated in the semester immediately following the one from which he has been dropped.
3. He will not be considered for transfer into the Division of Special Services if he has been dropped from a college more than twice, if he has thirty hours or more of "D," or if he has an American Council on Education score of less than the 35th percentile and is disapproved by the Testing Bureau.

Through the Director of Admissions of the University, the veteran can ascertain to what extent he may meet entrance or graduation requirements by credit for service or for courses taken through the United States Armed Forces Institute. Credit in military, physical education, and hygiene will be granted to any honorably discharged veteran who presents evidence that he has completed the basic training program in the Army, Navy, Marine Corps, or Coast Guard. Credit for work taken in college training programs, in technical schools, and in courses pursued while the veteran was in service may be transferred upon the basis of evaluation by the Director of Admissions at the University.

### CURRICULA

A great deal of freedom is granted in planning a specific curriculum for each student. For his first semester a fairly conventional program is worked out. During that semester he will be assisted, if he requests it, by the Testing Bureau, the Counseling Bureau, and the Division counselors in planning his four years. In many cases, professional men in education, medicine, law, engineering, and so forth, are consulted.

### REQUIREMENTS FOR GRADUATION

In order to receive the degree of Bachelor of Science from the Division, a veteran must

1. Be enrolled in the Division at the time of graduation.
2. Have completed 128 hours of acceptable University credit.
3. Have fulfilled the University rhetoric requirement.
4. Have a minimum of eight hours in each of the following areas: humanities, sciences, social sciences.
5. Have satisfied a department major requirement or completed thirty-two hours in one area of study.
6. Have satisfied the University residence requirement.
7. Have maintained a grade of "C" or better in three-fourths of his credit hours and an average of 3.0 in total University work.

For further information, the veteran may address the Office of the Director of the Division of Special Services for War Veterans, 249 Armory, Champaign.

Newly completed building for students in Veterinary Medicine.

# College of Veterinary Medicine

The College of Veterinary Medicine offers professional training in veterinary medicine and surgery. Men and women are trained to aid agriculture by the control of animal diseases and to protect the public health by the suppression and control of animal diseases communicable to man. These services to agriculture and public health require well-rounded educational and research programs that give students the maximum individual instruction and inspiring contacts with leaders in their chosen profession.

The first of two new buildings planned to house the college is approaching completion. The science unit provides staff offices, student laboratories, and classrooms for instruction in anatomy, histology, physiology and pharmacology, pathology, bacteriology, parasitology, food hygiene, and public health. Plans are being developed for the second unit to provide facilities for instruction in medicine, surgery, and obstetrics, and for hospitalizing animals.

The College of Veterinary Medicine has four academic departments: Anatomy and Histology, Clinical Medicine, Pathology and Hygiene, and Physiology and Pharmacology.

Two years of preveterinary instruction are required for admission. Preveterinary students may register in the College of Liberal Arts and Sciences (page 183), but equivalent preveterinary instruction may be taken at other recognized institutions.

The professional veterinary curriculum covers four years. The first two years are devoted largely to basic veterinary subjects including anatomy, physiology, bacteriology, parasitology, pharmacology, and pathology, while the last two years of the professional curriculum consist of instruction in clinical subjects such as medicine, surgery, and obstetrics. In keeping with modern trends in veterinary education, approximately two-thirds of the instruction in the fourth year is in clinical and laboratory practice in connection with the hospital and ambulatory clinics, where the student can apply knowledge gained in classroom and laboratory to the diagnosis, treatment, and prevention of animal diseases. Selected courses in animal science, dairy science, chemistry, bacteriology, food technology, and botany are required during the first three years.

Students in the professional curriculum receive the benefit of an instructional program which is constantly enriched by the latest advances in the science and practice of veterinary medicine. Graduate veterinarians are qualified for practice and for employment by federal and state agencies such as the United States Bureau of Animal Industry; large corporations such as meat packers, milk companies, and manufacturers of serums and

vaccines; state, county, and municipal livestock disease and regulatoı agencies; public health organizations; the Federal Food and Drug Admin stration; the Veterinary Corps of the Army; national and state wildlife coı servation agencies and zoological gardens; and institutions of educatio and research.

Programs of graduate study leading to advanced degrees in veterinaı pathology and hygiene are offered. Particular emphasis is placed on researc fundamental to the nature, cause, treatment, and control of animal disease Graduate study in veterinary medicine qualifies students for assignments i veterinary research and clinical specialties.

The college is affiliated with the Agricultural Experiment Station an Extension Service in research and extension. It cooperates with the Stat Department of Agriculture in the laboratory diagnosis of animal disease and in demonstrational programs of animal disease control, and with th State Natural History Survey in research on diseases of wildlife.

Inquiries pertaining to the curriculum in veterinary medicine and re quests for other information concerning the college should be addressed t the Dean of the College of Veterinary Medicine, University of Illinoi Urbana.

## REQUIREMENTS FOR ADMISSION

Applicants for admission to the College of Veterinary Medicine must present not le than sixty semester hours of acceptable credit from a recognized college or universit exclusive of military and physical education. The sixty semester hours must be distribute as follows:

| | HOUI |
|---|---|
| Chemistry (including organic and quantitative analysis) | 1 |
| Biological Science (botany and general zoology) | |
| Physics (including laboratory) | |
| Foreign Language | |
| English Composition and Rhetoric | |
| Electives in not less than two of the following fields: economics (including agricultural economics), fine arts, language, geography, history, literature, philosophy, political science, psychology, sociology, speech. Approximately one-half of these credits should be in the social sciences | |
| Free Electives | |
| Total | 6 |

Each applicant for admission to the College of Veterinary Medicine, whether fro the University or from another institution, must have attained in his preveterinary wor a scholastic average of not less than 3.5, or the equivalent as determined by the Un versity for institutions using a different grading system. General University requirement with reference to scholarship of non-Illinois residents will apply.

In considering applications for admission, preference will be given to candidate who are residents of Illinois and to Illinois veterans. Students are admitted only by th Director of Admissions and Records. Whenever the number of qualified applicants ex ceeds the number which can be admitted, selection will be made by a Committee o Admissions composed of the Director of Admissions and Records and members of th faculty of the college appointed by the Dean.

### REQUIREMENTS FOR GRADUATION

Students who have successfully completed the second year of the veterinary curriculum will be eligible for the degree of Bachelor of Science in Veterinary Medicine.

Students who have passed all courses in the veterinary curriculum and who have a minimum average of 3.0 will be eligible for the degree of Doctor of Veterinary Medicine.

## Curriculum in Veterinary Medicine

For the Degree of Doctor of Veterinary Medicine

| FIRST YEAR[1] FIRST SEMESTER | CREDIT HOURS | CLOCK HOURS | SECOND SEMESTER | CREDIT HOURS | CLOCK HOURS |
|---|---|---|---|---|---|
| An. Sci. 102—Principles of Feeding | 3 | 3 | An. Nutr. 301—Introduction to Animal Nutrition | 3 | 3 |
| Chem. 350—Biochemistry | 3 | 3 | Bact. 104—Elementary Bacteriology, or Bact. 300—General Microbiology | 5 | 7 or 9 |
| Chem. 354—Biochemistry Laboratory | 2 | 6 | D.S. 100—Introduction to Dairy Production | 3 | 4 |
| V.A. 311—Gross Anatomy | 5 | 12 | V.A. 312—Gross Anatomy | 5 | 12 |
| V.A. 313—Histology and Embryology | 5 | 12 | V.A. 314—Histology and Embryology | 5 | 12 |
| Total | 18 | 36 | Total | 21 | 38 or 40 |
| **SECOND YEAR** | | | | | |
| An. Sci. 103—Breeds and Market Classes of Livestock | 5 | 8 | An. Sci. 110—Plant and Animal Genetics | 3 | 3 |
| V.P.H. 323—Bacteriology and Immunology | 5 | 10 | An. Sci. 304—Poultry Management | 4 | 5 |
| V.P.H. 324—Parasitology | 5 | 9 | V.P.H. 325—General Pathology | 5 | 9 |
| V.P.P. 321—Physiology | 4 | 7 | V.P.P. 322—Physiology | 4 | 7 |
| | | | V.P.P. 329—Pharmacology | 3 | 3 |
| Total | 19 | 34 | Total | 19 | 27 |
| **THIRD YEAR** | | | | | |
| V.C.M. 331—Diseases of Small Animals | 5 | 5 | Bot. 226—Poisonous Plants | 2 | 4 |
| V.C.M. 335—General Surgery | 3 | 5 | V.C.M. 333—Breeding Problems and Obstetrics | 5 | 7 |
| V.C.M. 337—Clinical and Laboratory Practice | 2 | 8 | V.C.M. 334—Diseases of Large Animals | 5 | 5 |
| V.P.H. 326—Special Pathology | 5 | 9 | V.C.M. 336—Special Surgery | 5 | 7 |
| V.P.P. 330—Pharmacology | 4 | 6 | V.C.M. 338—Clinical and Laboratory Practice | 2 | 8 |
| | | | V.P.H. 332—Principles of Sanitation in the Processing and Handling of Foods | 2 | 4 |
| Total | 19 | 33 | Total | 21 | 35 |

[1] Only those students who have completed sixty hours of semester credit as described on page 234 are eligible to begin the first year's work in the College of Veterinary Medicine.

FOURTH YEAR

| | | |
|---|---|---|
| V.C.M. 341—Infectious Diseases of Large Animals | 5 | 5 |
| V.C.M. 343—Radiology | 1 | 1 |
| V.C.M. 345—Seminar | 1 | 1 |
| V.C.M. 347—Clinical and Laboratory Practice | 8 | 32 |
| V.P.H. 349—Diseases of Poultry | 3 | 3 |
| Total | 18 | 42 |

| | | |
|---|---|---|
| V.C.M. 340—Jurisprudence, Business Methods, and Ethics | 3 | 3 |
| V.C.M. 346—Seminar | 1 | 1 |
| V.C.M. 348—Clinical and Laboratory Practice | 8 | 32 |
| V.P.H. 344—Food Hygiene and Public Health | 5 | 7 |
| Total | 17 | 43 |

# RESERVE OFFICERS' TRAINING CORPS

ARMY R.O.T.C.

AIR FORCE R.O.T.C.

NAVAL R.O.T.C.

Rifle range for advanced R.O.T.C. students in summer camp.

# Reserve Officers' Training Corps

## ARMY R.O.T.C.

Military training has been given at the University since its beginning in 1868 under the charter issued by the state of Illinois, and in compliance with the federal law which provided for the establishment of land-grant colleges. Since World War I, this training has been augmented and further defined under the provisions of the Acts of Congress of 1916 and 1920 commonly known as the National Defense Acts. Under these laws, the Reserve Officers' Training Corps at the University was organized to provide the required basic training and to offer advanced voluntary training on a selective plan.

### Basic Course

The basic course R.O.T.C. constitutes a two-year course of instruction. This course fulfills the obligations of the University under the provisions of the Act of Congress known as the Morrill Act which was passed in 1862.

#### REQUIREMENTS

All male students, unless specifically exempted under University rules, must register for military training and must take the full basic course, whether they intend to graduate or not. If credit is to be counted toward graduation, the scheduled basic course of two years must be successfully completed. The exempted students may take military work, if they so desire, by registering for it, except that a student who is not a citizen of the United States or a student who holds a commission or a certificate therefor, in the Officers' Reserve Corps, Air Force, Army, Navy, or Marine Corps will not be permitted to register.

#### EXEMPTIONS

1. Students over twenty-two years of age when entering the University.
2. Students entering the University with junior standing.
3. Students who are not citizens of the United States.
4. Students who have satisfactorily completed two years of military training in other senior units of the R.O.T.C.
5. Students holding commissions in the Officers' Reserve Corps, Army, Navy, Air Force, or Marine Corps.
6. Students who are certified by the University Health Officer to be physically disqualified for military training.
7. Students who have had one year of active military service with any component of the Armed Forces.
8. Students enrolled in the N.R.O.T.C or A.R.O.T.C. at this University.
9. Students who have successfully completed at least three years of training in accredited junior R.O.T.C. units are required to take only one year's training with a senior unit. Students in this category must submit petitions to obtain exemption.
10. Students who are members of federally recognized units of the National Guard and are attending weekly drill meetings. Students must submit petitions for exemption under this category.
11. Students who are members of Enlisted Reserve Corps and are attending regular meetings may petition for exemption.

#### BENEFITS

1. Students who successfully complete the basic course together with two years of college academic work will receive a Military Training Certificate signifying eligibility, if otherwise qualified, to enter an Army Officers' Candidate Course, or to enlist in the Enlisted Reserve Corps in the grade of Private 1st Class.

2. If the student applies for and is accepted for enrollment or continuance in the R.O.T.C. program, he may receive deferment from Selective Service. In applying the student must agree to complete the basic and advanced courses, to accept a commission, if tendered, and to serve on active duty for a period of not less than two years subject to call by the Secretary of the Army. The deferment remains in effect as long as the student maintains the necessary academic and military proficiency. Incoming freshmen are eligible to apply. Approval of deferment depends on the action of a committee in determining potential officer qualifications.

### Advanced Course

The advanced course is a two-year course of instruction leading to a commission as a Second Lieutenant in either the Regular Army or the Officers' Reserve Corps. Selected advanced course students may be designated "Distinguished Military Students." A student so classified may apply for a commission in the Regular Army, and since there are now no quotas limiting the number who may be so appointed from any single institution, opportunities to enter a military career from an R.O.T.C. background are excellent.

#### REQUIREMENTS

1. Students must not have reached twenty-seven years of age at the time of initial enrollment.
2. Students must be physically fit.
3. Students must have completed the basic course, senior division R.O.T.C., or have received credit for equivalent training which is approved by the Professor of Military Science and Tactics and the University.
4. Students must complete successfully such survey and general screening tests as may be prescribed.
5. Students must execute a written contract with the government to complete the advanced course (contingent upon remaining in school) and to attend the advanced summer camp at the time specified.
6. Students must be selected by the Professor of Military Science and Tactics and the University.
7. Students must be enrolled in an academic field prescribed by the chief of a technical service if admission to a unit of a technical service is desired.

#### BENEFITS AND ALLOWANCES FOR ADVANCED COURSE CADETS

1. Commission either in the Regular Army or the Officers' Reserve Corps.
2. Deferment from Selective Service, if agreement is signed.
3. Officer-type uniform is furnished during training and kept upon successful completion.
4. Monetary allowance in lieu of subsistence of $27 a month, and approximately $112 for attending the advanced summer camp.
5. Academic credit of three hours a semester.

### Units, Staff, and Equipment

Units of the R.O.T.C. at the Urbana campus of the University are: Armor, Army Security Agency, Artillery, Corps of Engineers, Infantry, Ordnance Corps, Quartermaster Corps, Signal Corps, and Transportation Corps. There is a Medical Corps Unit and a Dental Corps Unit at the medical and dental colleges of the University in Chicago.

Army officers are detailed by the Department of the Army as instructors in the several units. The senior officer, as academic head of the University's Military Department,

is Professor of Military Science and Tactics. In the military organization he is Commandant of Cadets. All other officers hold appropriate subordinate academic and military positions on his staff. An enlisted detachment is also assigned to assist with the instruction.

The equipment for military instruction is furnished by the Department of the Army. It includes the necessary training equipment such as uniforms, weapons, and matériel.

The Armory is located on the south campus and includes classrooms, storerooms, offices, and an enclosed drill floor 400 feet long and 200 feet wide and 100 feet high at the center of the arched roof. Near by are the drill fields and parade grounds.

## AIR FORCE R.O.T.C.

The Air Force R.O.T.C. program was initiated at the University of Illinois at the beginning of the school year 1949-1950. This program offers the basic military training required of all students. An advanced course is offered to selected students. This advanced course leads to a Reserve Commission in the Air Force Reserve or, in the case of certain distinguished military students, a commission in the Regular Air Force.

### Basic Course

The basic course in the Air Force R.O.T.C. program is of two years duration and includes Air Force Science 111, 112, 113, and 114. The two years together fulfill the obligation of the University in relation to the Morrill Act which was passed in 1862. Students entering R.O.T.C at the University of Illinois are divided between the Air Force and Army in the ratio of 49.5 to 50.5. For this reason transfers between the two services are difficult to arrange. Transfers must be agreed to by the heads of both departments.

Selected students may be deferred from Selective Service.

#### REQUIREMENTS

All male students, unless specifically exempted under University rules, must register for military training and must take the full basic course, whether they intend to graduate or not. If credit is to be counted toward graduation, the scheduled basic course of two years must be successfully completed. The exempted students may take military work if they so desire, by registering for it.

#### EXEMPTIONS

1. Students over twenty-two years of age when entering the University.
2. Students entering the University with junior standing.
3. Students who have satisfactorily completed two years of military training in other senior units of the R.O.T.C.
4. Students holding commissions in the Officers' Reserve Corps of the Army, Navy, Air Force, or Marine Corps.
5. Students who are certified by the University Health Officer to be physically disqualified for military training.
6. Students who have had one year of active military service with any component of the Armed Forces.
7. Students enrolled in the N.R.O.T.C. or Army R.O.T.C. at this University.
8. Students who have successfully completed at least three years of training in junior R.O.T.C. units are required to take only one year's training with a senior unit. Students in this category must submit petitions to obtain exemption.
9. Students who are members of federally recognized units of the National Guard or Air National Guard, and are attending weekly drill meetings. Students must file petitions for exemption under this category.

## Advanced Course

The advanced course is a two-year course of instruction with emphasis placed on four options, Air Force Administration, Aircraft Maintenance, Flight Operations, and General Technical option. Applicants for advanced training who are enrolled in science, mathematics, or engineering can be enrolled in General Technical. Students who are enrolled in the College of Commerce and Business Administration or the College of Liberal Arts and Sciences enroll in Administration and Logistics. Students who are physically qualified may enroll in the Flight Operations option.

### REQUIREMENTS

1. Students must not have reached twenty-five years of age at the time of initial enrollment.
2. Students must pass a general service-type physical examination.
3. Students must have completed the basic course, senior division R.O.T.C. (Army, Navy, or Air Force), or have received credit for equivalent training which is approved by the Professor of Air Force Science and Tactics and the University. Veterans with one year or more of service are eligible to apply.
4. Students must complete successfully such survey and general screening tests as may be prescribed.
5. Students must execute a written statement with the government to complete the advanced course (contingent upon remaining in school), to attend the advanced summer camp at the time specified, and to accept an Air Force Reserve Officers' commission upon graduation. The summer camp is a concentrated laboratory of Air Force Science and Tactics.
6. Students must be selected by the Professor of Air Force Science and Tactics and the University.
7. In special cases advanced Air Force R.O.T.C. may be taken while the student pursues a graduate or professional degree.

### BENEFITS AND ALLOWANCES FOR ADVANCED COURSE CADETS

1. Commission in either the Regular Air Force or the United States Air Force Reserve.
2. Deferment from Selective Service.
3. Officer-type uniform is furnished by the government.
4. Monetary allowance in lieu of subsistence of approximately $27 a month and approximately $112 for attending advanced course summer camp of six weeks' duration between the junior and senior years.
5. Academic credit of three hours a semester.

## Staff and Equipment

Air Force officers are detailed by Air Force Headquarters as instructors in the Air Force R.O.T.C. Unit. The senior officer, as head of the Air Force Unit, is designated as Professor of Air Force Science and Tactics. He serves as Commandant of Air Force Cadets. All other officers hold appropriate subordinate academic and military positions on his staff. Airmen are assigned to assist with the instruction.

Equipment for Air Force instruction is furnished by the Air Force with many training aids in the form of aircraft engines, projectors, films, panels, and other equipment being available.

The Armory at the University of Illinois contains offices, classrooms, and a drill floor 400 feet long and 200 feet wide. All classes are held in the Armory.

Further inquiry concerning the Air Force R.O.T.C. program at the University should be directed to the Professor of Air Force Science and Tactics, Air Force R.O.T.C., University of Illinois, Champaign, Illinois.

## NAVAL R.O.T.C.

The Naval Reserve Officers' Training Corps was established under authority of Section 22 of the Act of Congress of March 4, 1925, as amended (34 U.S. Code, Sup. 821; Public Law 729, 79th Congress). The purpose of the Naval Reserve Officers' Training Corps is to provide, by a permanent system of training and instruction in essential naval subjects at civil educational institutions, a source from which qualified officers may be obtained for the Navy, the Marine Corps, the Naval Reserve, and the Marine Corps Reserve.

The obligations of land-grant institutions to provide military instruction imposed by the Act of July 2, 1862 (12 Stat. 503:7 U.S.C. 304), are not altered by the enacting law authorizing the N.R.O.T.C., or by these regulations. The military training requirements prescribed by the above Act are considered to be fulfilled by students who have successfully completed two years of naval science courses and drills.

### REQUIREMENTS FOR N.R.O.T.C. STUDENTS

A candidate for the N.R.O.T.C. must

1. Be a male citizen of the United States.
2. Have attained his seventeenth birthday on or before July 1 of the year of enrollment, and shall not have passed the twenty-first anniversary of his birth on that date. (If a minor, the candidate must have the consent of his parents or guardian at the time of his enrollment.)
3. Be physically qualified in accordance with current requirements detailed in the *Manual of the Medical Department, United States Navy.*
4. Be eligible for admission to the University.
5. Be and remain unmarried until commissioned.
6. Agree to:
   (a) Complete mathematics through trigonometry by the end of the second year unless such work is credited from secondary school.
   (b) Complete one year of college physics by the end of the second year. (For Regular Students only.)
   (c) Fulfill University requirements in written and oral expression.
   (d) Complete twenty-four semester hours of naval science.
   (e) Achieve proficiency as a swimmer.
   (f) Participate in required summer cruises.

The Naval Reserve Officers' Training Corps is now currently operating under the provisions of Public Law 729, Seventy-ninth Congress. This law is more generally known as the "Holloway Plan" and provides for the following three classes of N.R.O.T.C. students: Regular, Contract, and Naval Science.

**Regular.** Preliminary selection of the Regular student is based on results of a nationwide competitive examination conducted annually each fall, and the recommendation of an interviewing board which personally interviews the candidate. The final selection of the Regular student is made by a state selection committee consisting of three members—a prominent educator, a prominent citizen (from other than educational fields), and a senior naval officer (usually a professor of naval science). The Regular student undergoes a rigorous physical examination for which there are no waivers for defects.

When the candidate is notified that he is in all respects qualified, it is his responsibility to achieve admission to the N.R.O.T.C. college of his choice. In the case of Regulars who are appointed midshipmen in the United States Naval Reserve by the Secretary of the Navy, all costs of tuition, fees, and textbooks are paid by the government. Necessary uniforms are also provided by the government, and the Regular student receives retainer pay at the rate of $600 a year. Normally, students attend college for four years and may undertake any course leading to a baccalaureate degree, except predental, pre-

medical, pretheological, preveterinary, pharmacy, music, art, and veterinary medicine. They must include twenty-four credit hours of naval science plus certain minimum requirements in other academic fields including mathematics through trigonometry, one year of college physics, and proficiency in written and oral expression. They wear the uniform only when engaged in drills or other naval activities prescribed by the professor of naval science, and except for the ordinary requirements of gentlemanly conduct, they are subject to naval discipline only at those times.

The Regular student is required to make two summer cruises and to take one summer period of aviation indoctrination lasting from six to eight weeks each; and upon graduation he must accept a commission if offered as Ensign, U.S.N., or Second Lieutenant, U.S.M.C. After twenty-seven months to three years of active duty, he will be given the opportunity to serve an additional year and to apply for a permanent commission in the Navy or Marine Corps. Following this active duty period, if he does not choose to make the Navy or Marine Corps his career he may return to civilian life, retaining a commission in the Naval Reserve or Marine Corps Reserve. Such reserve commission must not be terminated prior to the eighth anniversary of the receipt of his first commission. Unless at his own request, a Reserve Officer is not called to active duty except during a war or national emergency.

**Contract.** Contract students are normally limited to a quota of about fifty-five new contracts entering each academic year and are selected by the Professor of Naval Science. The Contract student is a member of the N.R.O.T.C. but is not subsidized, except for a government subsistence allowance during his third and fourth years. The amount of this subsistence varies, but the current rate is approximately $27 a month. The Contract student is required to take only one cruise from two to three weeks in duration. This cruise is normally made upon the completion of the third year. He receives the pay of the seventh enlisted pay grade during this cruise, the current rate of pay being $78 a month. With the exception of the cruise requirements and the requirement for one year of college physics, the Contract student must fulfill all other requirements of the Regulars. Upon graduation the Contract student is commissioned an Ensign, U.S.N.R., or Second Lieutenant, U.S.M.C.R. Such commission must not be terminated prior to the eighth anniversary of the receipt of his first commission. He may, upon his own application, or if the Navy or the Marine Corps has need for his services, as is presently the case, be ordered to active duty for a period of two years.

**Naval Science.** The Naval Science student is not a member of the N.R.O.T.C. and is not subsidized. A Naval Science student may not go on cruises, and any Naval Science course undertaken by him will count only as an academic subject.

## Required Courses

| FIRST YEAR[1] FIRST SEMESTER | HOURS | SECOND SEMESTER | HOURS |
|---|---|---|---|
| N.S. 111—Naval History and Orientation | 3 | N.S. 112—Naval History and Orientation | 3 |
| **SECOND YEAR[1]** | | | |
| N.S. 121—Naval Weapons | 3 | N.S. 122—Naval Weapons | 3 |
| **THIRD YEAR[1]** | | | |
| N.S. 231—Navigation | 3 | N.S. 232—Navigation | 3 |
| N.S. 291—History of the Art of War[2] | 3 | N.S. 292—U.S. Military History and Policy[2] | 3 |

[1] One course must be taken by the student each semester.

[2] For Marine Corps candidates only. Marine Corps candidates substitute N.S. 291, 292, 293, and 294 for N.S. 231, 232, 241, and 242 respectively. In addition to these courses, N.R.O.T.C. students must also attend a two-hour laboratory period weekly.

**FOURTH YEAR**[1]

| | | | |
|---|---|---|---|
| N.S. 241—Naval Machinery and Diesel Engines | 3 | N.S. 242—Ship Stability, Naval Justice, and Leadership | 3 |
| N.S. 293—Amphibious Warfare[2] | 3 | N.S. 294—Amphibious Warfare, Leadership, and Uniform Code of Military Justice[2] | 3 |

The courses in naval science are technical to the extent of covering technical subjects with sufficient detail to permit a student who completes the courses to adapt himself quickly to any specific duty in the Navy that may be assigned him. In addition, it furnishes a background of naval experience, tradition, and custom that is necessary for an officer going into duty in the Navy.

The course fosters and demands ideals of character such as integrity, discipline, self-reliance, and cooperation which are essential to naval leadership. The association with experienced officers on the staff during the course permits close-knit cooperation in time of active service.

A staff of experienced naval officers is maintained at the University for the guidance and instruction of students. The Professor of Naval Science and the assistant professors of naval science are appointed to the University faculty. The staff is authorized a quota of six commissioned officers (not more than two of whom will be Marines), six petty officers, U.S.N., and one non-commissioned officer, U.S.M.C.

Currently, classes and instruction are conducted in the Armory. Equipment provided by the Navy Department is modern and reflects the latest developments of naval materials. Training aids provide instruction in the most recent methods of naval gunfire, antisubmarine warfare, radar search devices, signals, ship control, and ship damage control. Full use is made of visual and audio-training aids in keeping with the latest trend in educational principles in this field.

Students who desire more information and details should address correspondence to the Professor of Naval Science, N.R.O.T.C., University of Illinois, Urbana.

[1] One course must be taken by the student each semester.

[2] For Marine Corps candidates only. Marine Corps candidates substitute N.S. 291, 292, 293, and 294 for N.S. 231, 232, 241, and 242 respectively. In addition to these courses, N.R.O.T.C. students must also attend a two-hour laboratory period weekly.

# COURSES OF INSTRUCTION

# Courses of Instruction

The following list of undergraduate courses is arranged in alphabetic order of departments. The courses offered by each department are listed numerically in groups with headings to indicate the students for whom they are designed. Courses for undergraduates (freshmen and sophomores) are numbered 100 to 199; for advanced undergraduates (juniors and seniors), 200 to 299; and for advanced undergraduates and graduates (juniors, seniors, and graduates), 300 to 399.

Following the title of each course is a statement of the requirements, if any, for admission to the course. Special requirements for admission to certain courses are introduced by the word prerequisite. Terms of the year are represented by symbols: "S" for the summer term, "I" for the first semester, and "II" for the second semester.

Credit for undergraduate students is counted in semester hours. A semester hour represents the work of one classroom period of fifty minutes each week through one semester, or the equivalent in laboratory or field work. In descriptions of courses, "3" means three hours of credit each semester.

Students having ninety-five or more hours of credit, without regard to the division in which they may be enrolled, are classified as seniors for the purpose of designating those freshman courses which, when taken by seniors, will carry reduced credit.

Credit for graduate students taking courses numbered 300 to 399 is counted in units. A unit course requires approximately ten hours of time each week, through one semester, irrespective of the distribution of that time in class work, laboratory or field work, and private study.

In registering for a course with variable credit, each student puts on his registration program the number of hours for which he intends to take the course.

### Accountancy

(See Business Organization and Operation)

## AERONAUTICAL ENGINEERING

*Professors:* H. S. Stillwell (Head of Department), M. Z. Krzywoblocki, R. W. McCloy, J. M. Coan, P. Torda.
*Assistant Professors:* C. H. Fletcher, H. H. Hilton, A. I. Ormsbee.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Aircraft Materials and Processes.** Physical and chemical properties of materials used in aircraft construction; thermal and chemical treatments of aircraft materials; forming and fabrication. I, II; 3. Prerequisite: Sophomore standing. McCloy.

**211. Aerodynamics.** Fundamentals of aerodynamics as applied to the airplane. Introduction to the mechanics of perfect fluids; classical performance analysis; airplane stability. I, II; 3. Prerequisite: Mathematics 142; Theoretical and Applied Mechanics 156. Stillwell.

**212. Introduction to Aerodynamics of Real Fluids.** Introduction to the fundamentals of the theory of hydrodynamics as applied to real fluids. Attention is directed to solution of fluid flow problems in viscous-incompressible and inviscid-compressible fluids. I, II; 3. Prerequisite: Aeronautical Engineering 211. Krzywoblocki.

**220. Aircraft Structures.** Structural analysis as applied to aircraft. Beam deflection; unsymmetrical bending; moment distribution; introduction to shear flow. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 221 and 223. Coan.

**221. Aircraft Structures.** Continuation of Aeronautical Engineering 220. Bending and torsional analysis of single and multicell structures. Analysis of tension field beam columns; beam-columns; allowable stresses in thin metal structures. I, II; 3. Prerequisite: Aeronautical Engineering 220. Coan.

**231. Aircraft Power Plants.** A study of current and projected aircraft power plants from the standpoint of operation, efficiencies, construction; fuels and fuel systems; combustion; air compression, etc. I, II; 3. Prerequisite: Mechanical Engineering 205. Torda.

**241. Airplane Design.** Preliminary design of the airplane primarily from the aerodynamic standpoint; planning through to the three-view layout; weight and balance computation; fundamental dynamics of the airplane; airload distribution. I, II; 3. Prerequisite: Aeronautical Engineering 212. Stillwell.

**242. Airplane Design.** Airworthiness requirements, stress analysis procedure, and design of the airplane structure. Introduction to problems in the dynamics of aircraft structures. I, II; 3. Prerequisite: Aeronautical Engineering 221 and 241. Hilton.

**261. Aerodynamics Laboratory.** Experimental aerodynamics illustrating fundamental aerodynamic principles and basic wind tunnel testing techniques. I, II; 2. Prerequisite: Aeronautical Engineering 212. Hilton.

**262. Aircraft Engine Laboratory.** Evaluation of current aircraft power plants by means of experimental methods. I, II; 2. Prerequisite: Aeronautical Engineering 231. McCloy.

**264. Aircraft Structures Laboratory.** Physical testing of aircraft components, use and calibration of instruments, tests showing accuracy of existing theory. I, II; 2. Prerequisite: Aeronautical Engineering 221. Coan.

**290. Seminar.** Reports and discussions of recent developments in the fields of aerodynamics, aircraft power plants, aircraft structures, and aircraft maintenance and operation. I, II; 1. Prerequisite: Senior standing. Coan.

**299. Inspection Trip.** Visit to airplane manufacturing plants and research institutions. I. no credit. Prerequisite: Senior standing.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Aerodynamics of Perfect Fluids.** Fundamental equations, plane irrotational flow, vortex flow, combination fields of flow, Kutta-Joukowski theorem, application of conformal transformation to fields of flow, particle paths, fields of flow relative to axes fixed in fluid, velocity potential, three-dimensional fields. I; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212. Krzywoblocki.

**312. Aerodynamics of Real Fluids.** Characteristics of viscous and compressible fluids, including boundary layer theory, surface friction drag, turbulence, and two-dimensional subsonic and supersonic flows. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212. KRZYWOBLOCKI.

**314. Airplane Performance.** The performance of conventional and unconventional aircraft developed on basic physical principles with additional empirical modifications where practical. Special attention is given to problems and methods of solution found in the industry. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 211. STILLWELL.

**316. Stability and Control.** An introduction to dynamics of the airplane, airplane control, and airplane maneuverability. I; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 211; Mathematics 341 or 345. HILTON.

**318. Airplane Propellers.** Propeller blade action theory; aerodynamic propeller testing; effect of the propeller on airplane performance; blade design and stress analysis. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 212; Theoretical and Applied Mechanics 221. STILLWELL.

**320. Indeterminate Aircraft Structures.** Virtual work and least work methods; analysis of fuselage rings and frames; indeterminate unsymmetrical space frameworks; application of energy methods to buckling of non-uniform columns. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 221. COAN.

**331. Combustion, Fuels, and Lubricants.** A study of the phenomena of combustion and combustion calculations; characteristics of fuels and lubricants for reciprocating engines, air-breathing jets, and rockets. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 205. MCCLOY.

**332. Aircraft Power Plant Design.** The aerodynamic and thermodynamic design of aircraft power plants including reciprocating engines, turbo jets, pulse jets, ram jets, and rockets. II; 3 hours, or ½ unit. Prerequisite: Aeronautical Engineering 231 and 331. MCCLOY.

**341. Aircraft Component Design.** Design and analysis of aircraft hydraulic, electrical, pneumatic, mechanical, de-icing, and cabin atmospheric control systems. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 222; Electrical Engineering 202 and 203. STILLWELL.

**391. Special Problems.** Special problems relating to the theory, design, testing, operation, maintenance, or production of airframes or aircraft power plants. I; 2 to 4 hours, or ½ to 1 unit. Prerequisite: Senior standing in engineering; consent of instructor. COAN, KRZYWOBLOCKI, MCCLOY, STILLWELL, TORDA.

**392. Special Problems.** Special problems relating to the theory, design, testing, operation, maintenance, or production of airframes or aircraft power plants. II; 2 to 4 hours, or ½ to 1 unit. Prerequisite: Senior standing in engineering; consent of instructor. COAN, KRZYWOBLOCKI, MCCLOY, STILLWELL, TORDA.

**393. Theoretical Problems in Aeronautical Engineering.** This is a course flexible in specific content and providing an opportunity for broadening the student's understanding of analytical methods. Topics from the fields of aerodynamics, structures, mechanics, and propulsion will be chosen according to the student's interests and needs. I; 3 hours, or ½ unit. Prerequisite: Senior standing; consent of instructor. HILTON, TORDA.

## AGRICULTURAL ECONOMICS

*Professors:* H. C. M. CASE (Head of Department), J. B. ANDREWS, R. C. ASHBY (Emeritus), R. W. BARTLETT, H. W. HANNAH, R. R. HUDELSON, P. E. JOHNSTON, G. L. JORDAN, D. E. LINDSTROM, J. W. LLOYD (Emeritus), M. L. MOSHER (Emeritus), L. J. NORTON, R. C. ROSS, C. L. STEWART, E. J. WORKING.

*Associate Professors:* A. T. Anderson, J. B. Cunningham, R. J. Mutti, E. H. Regnier, L. J. Simerl, L. F. Stice, G. B. Whitman, R. H. Wilcox, J. E. Wills.
*Assistant Professors:* E. E. Broadbent, W. D. Buddemeier, C. L. Folse, T. A. Hieronymus, R. A. Kelly, F. J. Reiss, W. N. Thompson, V. I. West, W. J. Wills.
*First Assistants:* J. B. Claar, N. G. P. Krausz, W. F. Lomasney.
*Assistants:* W. H. Alexander, R. J. Becker, L. D. Erlewine, W. L. Fitzgerald, W. J. Foreman, D. K. Freebairn, A. G. Harms, W. H. Heneberry, W. M. Herr, R. A. Hinton, F. E. Justus, Jr., M. B. Kirtley, G. C. Kleiman, J. R. Lauer, A. G. Mueller, J. R. Roush, C. P. Schumaier, G. W. Stone, R. N. Van Arsdall, M. V. Waananen.

### COURSES FOR UNDERGRADUATES

**100. Introductory Agricultural Economics.** Historical basis of current farm problems; relation of production to domestic and foreign demand; marketing, prices, finance, taxation, farm records; social relationships. I, II; 3. No credit given to juniors and seniors. Ross and others.

**177. Farmers' and Rural Organizations.** A study of the field of farmers' and rural organizations; their historical background and development; their systems, programs, work, comparative functions, and guiding processes; and their relation to national policy and rural welfare. Field trip to be arranged; estimated expense not to exceed $5. II; 3. Prerequisite: Sophomore standing. Bartlett.

### COURSES FOR ADVANCED UNDERGRADUATES

**200. Problems in Agricultural Economics.** Individual research work with senior members of the department in the following fields: (a) agricultural marketing; (b) agricultural prices and statistics; (c) farm management; (d) land economics; (e) rural organization. Students may also receive credit in this course for directed research done in preparation for intercollegiate debating on agricultural economic problems. I, II; 3 to 5. Prerequisite: Approval of head of department. Staff.

**201. Economic Relationships of Agriculture.** Changes affecting the place of farming in American life; the changing place of American agriculture in world economy. I; 3. Prerequisite: Economics 102 and 103, or 108. Offered in 1951-1952 and in alternate years. Stewart.

**211. Agricultural Economies of Latin-American Countries.** Agricultural products and producing regions; land used in agriculture and forestry, its ownership and operation; technological advances in farm and ranch operations; agricultural communities; impact of corporate developments for export production; opportunities for agricultural service; the place of agriculture in hemispheric and world solidarity. I; 3. Stewart.

**218. Land Economics.** Farm land prices, rents, taxes, tenancy, transfer; procedures in purchasing and improving land, aiding conservation, and promoting sound land use. II; 3. Prerequisite: Economics 102 and 103, or 108. Stewart.

**220. Farm Management.** Principles of farm organization and operation for conservation of resources and profit; farmstead arrangement; interpretation of farm records; tenure and types of leases; home farm problem. Field trips required; estimated expense, $2. I, II; 3. Johnston.

**230. Marketing of Agricultural Products.** Methods followed and agencies engaged in marketing farm products; services performed; factors affecting prices; market channels used in ways of lowering costs. I, II; 3. Hieronymus, Mutti.

**277. Rural Sociology.** Same as Sociology 277. A study of the importance of rural life, its social problems and means of solution. The importance of a scientific study of these factors concentrating primarily on the social aspects of physical conditions, population, occupations, the family, the neighborhood, community organizations, the church, the school, the library, adult education, local government, recreation, country life movements, and possible future trends affecting rural life. Field trip to be arranged; estimated expense not to exceed $5. I, II; 3. Folse.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**302. Financing Agriculture.** Capital and credit needs of farmers; agencies supplying credit needs; problems of borrowers and lenders. II; 3 hours, or ½ unit. Prerequisite: Economics 102 and 103, or 108. NORTON.

**303. Agricultural Law.** Relation of common law principles and statutory law to problems of land tenure, farm tenancy, farm labor, and farm management. I, II; 3 hours, or ½ unit. Prerequisite: Senior standing, or consent of instructor. HANNAH.

**305. Agricultural Development and Policies.** Agricultural development in the United States presented as a basis for analyzing the effectiveness of past agricultural policies, delineating agricultural problems, and the need of developing sound agricultural policies in keeping with a sound national economy. I; 3 hours, or ½ to 1 unit. Offered in 1952-1953 and in alternate years. CASE.

**312. Farm Appraisals.** Same as Agronomy 312. Valuation of farm real estate; soils, crops, management, buildings, drainage, land titles, prices, and taxes in relation to value. Local field trips; estimated expense, $5. II; 5 hours, or 1 unit. Prerequisite: Agronomy 201 and Agricultural Economics 220, or equivalent. HUDELSON and others.

**324. Farm Operation.** Operating costs in farming, analysis of farm jobs, farm work simplification, selecting power units and equipment for economical operation. Field trips; estimated expense, $2. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 220. J. E. WILLS.

**325. Advanced Farm Management.** Planning the farm business for soil conservation and profit; fitting the livestock organization to the kind of crops produced and to market outlets; economic information for farm planning; measures of farm efficiency; labor and power problems. Field trips to study successful farms; estimated expense, $5. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 220. BUDDEMEIER, JOHNSTON.

**331. Grain Grading and Marketing.** Same as Agronomy 331 and Marketing 331. Factors affecting the quality of grain crops; standards employed in their classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

**332. Livestock Marketing.** Same as Marketing 332. Problems and practices in marketing livestock. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or consent of instructor. W. J. WILLS.

**333. Marketing Horticultural Products.** Same as Horticulture 333 and Marketing 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or five hours of horticulture. KELLY.

**334. Marketing Dairy Products.** Same as Dairy Science 334 and Marketing 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

**341. Agricultural Statistics.** Statistical methods with special applications to agricultural problems, including price behavior. Students receiving credit in this course will not receive credit in Agriculture 216. I; 3 hours, or ½ unit. JORDAN.

342. **Agricultural Prices.** A study of the factors affecting prices of agricultural products long-time, cyclical, seasonal, and other price movements; sources of information relating to production and demand factors; government activities as they relate to prices of agricultural products and problems in price analysis and forecasting. II; 3 hours or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. JORDAN.

## Agricultural Education

(See Education)

# AGRICULTURAL ENGINEERING

*Professors:* E. W. LEHMANN (Head of Department), D. G. CARTER, R. C. HAY, K. H. HINCHCLIFF, G. E. PICKARD, R. I. SHAWL.
*Associate Professor:* A. L. YOUNG.
*Assistant Professor:* F. W. ANDREW.
*Associates:* H. P. BATEMAN, J. H. RAMSER.
*Instructors and First Assistants:* A. R. AYERS (on leave), W. BOWERS, J. T. CLAYTON, J. O. CURTIS (on leave), M. W. FORTH, M. R. HODGELL, R. W. KLEIS, W. F. LYTLE (on leave), J. W. MATTHEWS, E. J. MONKE, R. W. MOWERY, B. F. MUIRHEID, H. L. WAKELAND, J. A. WEBER (on leave), D. W. WINTER.
*Assistants:* D. L. BRAKENSIEK, H. S. BRANDENBURG, E. G. BRUNS, D. F. HOPKINS, W. D. LEMBKE, G. F. SAUER.

### COURSES FOR UNDERGRADUATES

101. **Introduction to Agricultural Engineering.** Agricultural problems involving application of engineering knowledge and methods; land engineering, power and machinery, buildings and equipment. Lectures, recitations, and laboratory. I, II; 3. Student with 95 or more credit hours receive only 2 hours credit. RAMSER, YOUNG.

111. **Farm Structures and Soil and Water Conservation.** Principles of plan, construction and adaptation of structures to farm needs; study of drainage, soil erosion control and water conservation on farms. For vocational agriculture majors and agricultural engineers. Lectures, discussion, and laboratory. I, II; 3. Students with credit in Agricultural Engineering 252 or 272 will not receive credit in this course. Prerequisite: Sophomore standing. CARTER, HAY, MONKE.

112. **Tractors and Field Machinery.** The design, construction, and application of gas engines, tractors, and field machinery. For vocational agriculture majors and agricultural engineers. Lectures, quiz, and laboratory. Inspection trip; estimated expense $3. I, II; 3. Students with credit in Agricultural Engineering 131 or 142 will not receive credit in this course. Prerequisite: Sophomore standing. SHAWL.

131. **Field and Power-Driven Machinery.** Theory of design and construction; operation and management of machines for soil and feed preparation; seeding, cultivating, and harvesting. Lectures, recitations, and laboratory. I; 3. Students with credit in Agricultural Engineering 112 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101. SHAWL.

142. **Gas Engines and Tractors.** Theory of construction and operation of engines, timing, ignition, carburetors; fuels, carburetion, lubrication, cost of operation, and trouble work. Lectures, recitations, and laboratory. Inspection trip; estimated expense, $10. II; 3. Students with credit in Agricultural Engineering 112 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101. SHAWL.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Farm Shop Work.** Special ten-week course for practice teachers. Farm machinery and equipment repairs, construction jobs, care of tools, electric wiring, welding, metal work. Recitations and laboratory. I, II; 3. Prerequisite: Agricultural Engineering 111 and 112, or consent of instructor. MATTHEWS.

**204. Spraying.** Same as Horticulture 204. A study of spray materials and equipment used for control of insects and diseases on horticultural crops. II; 3. Prerequisite: Horticulture 142 or 161, Chemistry 101 or 102, Agricultural Engineering 101, or consent of instructor. Offered in 1951-1952 and in alternate years. PICKARD, POWELL.

**241. Electric Power for the Farm.** Utilization of electricity in agriculture for power, heat, and light; types of motors and typical applications, water pumping, hay curing, feed processing; heating and lighting applications; circuits and wiring. Lectures, discussions, and laboratory. I; 3. Prerequisite: Agricultural Engineering 101, or equivalent. KLEIS.

**242. Advanced Gas and Diesel Engines and Tractors.** Principles of design, construction, and assembly; belt horsepower ratings, starting and lighting systems, lubricants, fuels, and modern shop methods used in repair and checking. Lectures, discussions, and laboratory. I; 3. Prerequisite: Agricultural Engineering 112 or 142. SHAWL.

**252. Mechanics of Soil and Water Conservation.** Principles of planning, constructing, and adapting soil conservation and drainage practices for Illinois farms, and the application of surveying to these practices. Lectures, field work, and laboratory. II; 3. Students with credit in Agricultural Engineering 111 receive only 2 hours credit. HAY, MONKE.

**262. Farmstead and Home Equipment.** Equipment for modernizing the farm home—principles, definitions, and problems as they relate to water supply, plumbing, sewage disposal, heating, fuels, refrigeration, air conditioning, and lighting. Lectures, discussions, and laboratory. II; 3. Prerequisite: Junior standing in agricultural engineering, or consent of instructor. KLEIS, LEHMANN.

**272. Farm Buildings.** Requirements of farm buildings, problem analysis and planning; plans, materials, construction methods, and costs. Lectures, discussions, and laboratory. II; 3. Students with credit in Agricultural Engineering 111 receive only 2 hours credit. Prerequisite: Agricultural Engineering 101, or consent of instructor. CARTER, WAKELAND.

**299. Inspection Trip.** I; no credit. Prerequisite: Senior standing in agricultural engineering.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**331. Function, Application, Adjustment, and Management of Farm Machinery.** A study of field and farmstead machinery as related to the needs of agricultural production, systems of farming, function, construction, maintenance, and operation cost. S; 3 hours, or ½ unit. Prerequisite: Agricultural Engineering 112 or 131, or consent of instructor. Offered in alternate years. MATTHEWS, SHAWL.

**332. Design of Agricultural Machinery.** Survey of needs and requirements, layout of design, cost comparison, and study of production problems. II; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 271. PICKARD.

**341. Farm Power.** Basic theory, analysis, and testing of internal combustion engines, gasoline and diesel, together with study of other elements of farm tractors. I; 3 hours, or ½ unit. Prerequisite: Mechanical Engineering 202. PICKARD.

**351. Hydraulics of Soil Conservation.** Hydrology, hydraulics, design, construction, and cost estimates of erosion control structures, water conservation dams, agricultural

drainage systems, and soil conservation practices. Relationships of slopes, soils, croj and practices. Lectures, field trips, and problems. I; 3 hours, or ½ unit. Prerequisit Civil Engineering 115; Theoretical and Applied Mechanics 232 and 234; seni standing in agricultural engineering, or consent of instructor. HAY.

**355. Advanced Soil and Water Conservation Practices.** A study of conservation pra tices and their evaluation in relation to farm operations. Planning, constructing, a checking of terraces, waterways, diversion ditches, and drainage systems. S; 3 hou or ½ unit. Prerequisite: Agricultural Engineering 111 or 252, or consent of instructo HAY.

**361. Development and Function of Family Housing.** Same as Home Economics 3€ Study of principles and problem solutions in family housing. Basic functions, plan p terns, types, materials, and structures; economic influences, costs, and adaptatio personal and public interests. Lectures, discussions, and problems. II; 3 hours, or unit. CARTER.

**371. Advanced Farm Structures.** I; 3 hours, or ½ unit. Prerequisite: Theoretical a Applied Mechanics 221 and 223; Civil Engineering 261; senior standing. CARTER.

**393. Special Problems.** Each student chooses a special problem for design, laboratory, field work, with library research. Work may be taken in two of the following subject drainage and soil erosion control, farm buildings, farm housing, farm power, farm m chinery, rural electrification. I, II; 3 hours, or ½ unit. Prerequisite: Senior standin approval of head of department. STAFF.

## AGRICULTURE

*Professor:* W. G. KAMMLADE.
*Associate Professor:* H. W. BEAN.
*Assistant Professor:* J. K. MCDERMOTT.

NOTE: Courses listed under Agriculture are those in the College of Agriculture r assignable to a particular department. They are taught by members of the administrati staff. Associate Dean R. R. Hudelson is responsible for administrative matters pertai ing to these courses.

There is no provision for majors or minors under the title "Agriculture." Major a minor programs are assigned to organized departments of the college.

### COURSES FOR UNDERGRADUATES

**114. Agricultural Information Methods.** Principles and practices of writing agricultu and home economics educational information. Methods of gathering and prepari such information for use in weekly and daily newspapers and on farm and ho radio programs in support of extension and other educational programs. I, II; Prerequisite: Sophomore standing. MCDERMOTT.

### COURSES FOR ADVANCED UNDERGRADUATES

**206. Agricultural Extension.** For students interested in agricultural extension work. II; KAMMLADE.

**208. Agricultural Extension: Summer Training.** Full-time work with extension serv programs in selected counties under the direction of farm advisers and district sup visors. Approximate training period, three months—June to September. Salary su cient to cover maintenance and expenses will be provided. S; 2. Prerequisite: Cons of instructor. It is recommended that this course be preceded by Agriculture 2( KAMMLADE.

**215. Advanced Agricultural Information Methods.** Writing of agricultural and ho economics information for mass circulated magazines and technical journals. Writi

and editing of informational bulletins and leaflets. Use of illustrations and other visual aids in presenting educational information. I, II; 3. Prerequisite: Agriculture 114, or consent of instructor. McDermott.

216. **Experimental and Biological Statistics.** A study of statistical methods and their value in agricultural experimentation. Students receiving credit in this course will not receive credit in Agricultural Economics 341. I, II; 3. Bean.

## AGRONOMY

*Professors:* M. B. Russell (Head of Department), F. C. Bauer, W. M. Bever, O. T. Bonnett, R. H. Bray, W. L. Burlison (Emeritus), E. E. DeTurk (Emeritus), G. H. Dungan, J. E. Gieseking, J. C. Hackleman (on leave), R. W. Jugenheimer, B. Koehler, L. T. Kurtz, A. L. Lang, C. M. Linsley, R. T. Odell, O. H. Sears, R. S. Smith (Emeritus), E. H. Tyner, D. C. Wimer, C. M. Woodworth.

*Associate Professors:* E. B. Earley, J. A. Jackobs, S. W. Melsted, R. S. Stauffer, E. D. Walker.

*Assistant Professors:* A. H. Beavers, C. H. Farnham, J. B. Fehrenbacher, J. W. Gerdemann, P. E. Johnson, E. R. Leng (on leave), L. B. Miller, W. F. Purnell, W. O. Scott, H. J. Snider, A. Tate (Emeritus), A. U. Thor, P. T. Veale, H. L. Wascher, R. O. Weibel.

*Associate:* C. J. Badger.

*Instructors and First Assistants:* D. E. Alexander, J. D. Alexander, L. F. Bauman, H. L. Breland, A. F. Grandt, J. H. Griffin, W. E. Kennedy (on leave), D. L. Lynch, J. C. Lyons, J. W. Pendleton, B. W. Ray, R. H. Rust, F. W. Slife, D. A. Vinson.

*Assistants:* J. C. Anderson (Emeritus), D. K. Banerjee, G. R. Bauwin, W. R. Fortney, H. Gallick, H. W. Gausman, C. Gray, L. H. Hannah, R. D. Hauck, H. R. Hinderliter, R. H. Maier, D. L. Mulvaney, J. C. Neill, J. L. Nelson, W. C. Nelson, W. R. Oschwald, Joan A. Rheumer, C. L. Rhykerd, D. A. Russel, T. C. Tucker.

### COURSES FOR UNDERGRADUATES

110. **Plant and Animal Genetics.** Same as Animal Science 110, Dairy Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104. Alexander, Dayton, Roberts, Touchberry.

121. **Crop Production.** General introductory course. Production and harvesting of common farm crops; means of improvement; diseases, insects, weeds, and their control; seed purity and germination; market grades of grain. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Botany 100. Dungan, Hannah, Nelson.

### COURSES FOR ADVANCED UNDERGRADUATES

200. **Special Problems in Agronomy.** Individual problems in crops or soils. I, II; 3 to 5. Prerequisite: Senior standing; consent of instructor. Staff.

201. **Soils.** General introductory course. Origin, formation, and nature of soils; kinds of soils and their properties; conservation and increase of productive capacity; fertilizers, management practices, and cropping systems. I, II; 5. Prerequisite: Chemistry 101 or 102; Geology 105. Bauwin, Tyner, Wimer.

270. **Raw Materials for Processing.** Same as Food Technology 270. Lectures, reference readings, and laboratory work on cereal grains and oilseeds important to the food processing industry. Local field trips to grain and oilseed storage elevators or mills. II; 3. Prerequisite: Botany 100, or equivalent. Dungan, Garner.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Genesis, Morphology, Classification, and Geography of Soils.** Factors governing and processes active in soil development; physical and chemical properties of the soil

groups of the world; classification and nomenclature of soil; soil geography. Field tri to be arranged; cost not to exceed $16. II; 3 hours, or ½ unit. Prerequisite: Agronon 201. BEAVERS.

302. **Role of Microorganisms in Soil Fertility.** Microorganisms of the soils in relation fertility; nitrogen fixation, assimilation, and preservation. I; 3 hours, or ½ unit. Pr requisite: Agronomy 201. LYNCH, SEARS.

303. **Soil Productivity, Its Variation, Modification, and Conservation.** Factors affecti soil productivity and its conservation; soil type response; influence of cropping sy tems, fertilizers, and management practices on productivity trends. II; 3 hours, ½ unit. Prerequisite: Agronomy 201; senior standing. BAUER.

304. **Metabolism of Soil Microorganisms.** Chemistry and bacteriology of the nitrog cycle; nitrogen fixation, nitrification, nitrate assimilation, denitrification, and synth sis of nitrogen compounds by microorganisms; relation of nitrogen to other cycl II; 3 hours, or ½ unit. Prerequisite: Bacteriology 104 or 320; Chemistry 132. LYNC SEARS.

305. **Physical Methods for Soil Conservation Studies.** Physical properties of soils affecti conservation, productivity, and drainage; their investigation by field and laborato methods. Lecture, discussion, and laboratory. I; 3 hours, or ½ unit. Prerequisit Agronomy 201. Offered in 1951-1952 and in alternate years. STAUFFER.

306. **Fertilizers and Their Soil Reactions.** Fertilizer sources and materials. Chemic forms of elements in the soil, reactions of fertilizers in soils, determination of fertiliz needs, soil test methods, fertilizer application. I; 3 hours, or ½ unit. Prerequisit Agronomy 201. BRAY.

307. **Principles of Soil Conservation.** National and local implications of soil conservati and its relation to farming systems, land management, climate, soil character, a farming operations. II; 3 hours, or ½ unit. Prerequisite: Agronomy 121 and 201; seni standing. STAUFFER.

308. **Plant Composition and Chemurgy.** Synthesis, general chemistry, and principal sour of carbohydrates, oils, and proteins. Chemical composition of agronomic plants affected by rate and date of planting and by nutritional, environmental, and genet factors. Relation of plant composition to utilization. II; 3 hours, or ½ unit. Prerequ site: Chemistry 132, or equivalent; Agronomy 121; Agronomy 201, or consent instructor. EARLEY, LYONS.

311. **Physical Edaphology.** The underlying principles of the influence of physical pro erties of soils on plant growth. The application of these principles to practic problems of tillage, drainage, conservation, and plant nutrition. II; 3 hours, ½ unit. Prerequisite: Agronomy 201. RUSSELL.

312. **Farm Appraisals.** Same as Agricultural Economics 312. Valuation of farm real estat soils, crops, management, buildings, drainage, land titles, prices, and taxes in relati to value. Local field trips; estimated expense, $5. II; 5 hours, or 1 unit. Prerequisit Agronomy 201 and Agricultural Economics 220, or equivalent. HUDELSON and other

317. **Plant Pathology.** Same as Botany 317, Horticulture 317, and Plant Pathology 31 Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisit One year of plant science including Botany 100. BLACK.

321. **Crop Production as Affected by the Environment.** Response of crop plants to the habitat; study of climatic, physiographic, edaphic, and biotic factors of the enviro ment in relation to crop growth; means by which crop hazards may be reduced. 3 hours, or ½ unit. Prerequisite: Agronomy 121. DUNCAN.

322. **Forage Crops and Pastures.** Lectures and discussions of roughage production, forag crop characteristics and ecology, grasslands of farm and range as related to anim production and soil conservation. II; 3 hours, or ½ unit. Prerequisite: Agronom 121. JACKOBS.

**323. Improvement of Farm Crops by Breeding.** Heredity and variation in crop plants; effects of self-fertilization and cross-fertilization; principles and results of selection and hybridization in crop improvement. I; 3 hours, or ½ unit. Prerequisite: Agronomy 110, or equivalent; Agronomy 121. BONNETT.

**324. Principles of Field Plot Experimentation.** Purposes, methods, and principles of field experimentation; interpretation of results. I; 3 hours, or ½ unit. Prerequisite: Senior standing. WOODWORTH.

**325. Corn Breeding.** Principles and procedures involved in developing, testing, and production of inbred lines and hybrids; production and processing of hybrid seed corn; genetics of corn. II; 3 hours, or ½ unit. Prerequisite: Agronomy 323. JUGENHEIMER.

**326. Weeds and Their Control.** Weeds, their introduction, methods of dissemination, reproduction, and control. A characterization of the common weeds of the Midwest. I; 3 hours, or ½ unit. Prerequisite: Agronomy 121. SLIFE.

**331. Grain Grading and Marketing.** Same as Agricultural Economics 331 and Marketing 331. Factors affecting the quality of grain crops; standards employed in their classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

**377. Diseases of Field Crops.** Same as Botany 377 and Plant Pathology 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Agronomy 121 or 317, or consent of instructor. BEVER, GERDEMANN.

**379. Research Methods in Plant Pathology.** Same as Botany 379, Horticulture 379, and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Agronomy 317; senior standing. GERDEMANN, GOTTLIEB.

## AIR FORCE SCIENCE

*Professor:* Colonel H. D. DAVIDSON (Head of Department).
*Associate Professor:* Lieutenant Colonel D. W. COX.
*Assistant Professors:* Majors R. F. ADKINS, F. W. BROCKHOUSE, E. W. KRETZSCHMAR, C. L. ODUM, G. B. POTTER, A. A. SCHRAMM, R. P. STEWART; Captains W. F. JEMISON, W. E. KENNEDY, R. L. MYERS, N. ROITMAN, N. A. ROSSER, E. W. SPITZER, J. R. STARNES, J. W. VAN SICKLE; First Lieutenant J. CALKINS.
*Assistants:* Master Sergeants R. D. ARCADY, H. D. CHARLES, J. L. EKISS, B. I. FIEDLER, J. D. HATHAWAY, J. S. SMALLWOOD, C. E. TOWERS, M. A. WILSON; Technical Sergeant R. W. CURTIS; Staff Sergeants R. B. PETERS, M. A. SYMINGTON, JR.

### COURSES FOR UNDERGRADUATES

**11. Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, and thirty hours devoted to world political geography, a study of the areas and resources of the various states organized as political units, together with the people who live in these areas. I; 1. Prerequisite: Pronounced physically fit by the University. KENNEDY, ROSSER.

**12. Freshman Drill and Theory.** Continuation of Air Force Science 111. Basic military instruction to include leadership, drill and exercise of command, and thirty hours devoted to world political geography. I; 1. Prerequisite: Air Force Science 111, or equivalent as determined by head of department and institution. KENNEDY, ROSSER.

113. **Sophomore Drill and Theory.** Basic military instruction to include leadership, dril and exercise of command, aerodynamics and propulsion, and meteorology. I; 1. Pre requisite: Air Force Science 112, or equivalent as determined by head of departmen and institution. MYERS, ODUM, SPITZER.

114. **Sophomore Drill and Theory.** Basic military instruction to include leadership, dril and exercise of command, navigation, and applied air power. II; 1. Prerequisite: Ai Force Science 113, or equivalent as determined by head of department and institution MYERS, ODUM, SPITZER.

### COURSES FOR ADVANCED UNDERGRADUATES

215. **Junior Administration and Logistics.** The development of knowledge and skill i organization, leadership and exercise of command, air operations, transportation, ad ministration and supply. I; 3. Prerequisite: Air Force Science 114, or equivalent a determined by head of department and institution. KRETZSCHMAR.

216. **Junior Administration and Logistics.** Continuation of Air Force Science 215, wit emphasis on Air Force supply. II; 3. Prerequisite: Air Force Science 215, or equiva lent as determined by head of department and institution. KRETZSCHMAR.

217. **Senior Administration and Logistics.** Continuation of Air Force Science 216, t include Air Force management, Air Force teaching method, and military law an boards. I; 3. Prerequisite: Air Force Science 216, or equivalent as determined b head of department and institution. SCHRAMM.

218. **Senior Administration and Logistics.** Continuation of Air Force Science 217, t include career development, food service supervision, inspector general, administra tion, staff functions, and air comptroller. II; 3. Prerequisite: Air Force Science 217 or equivalent as determined by head of department and institution. SCHRAMM.

225. **Junior Aircraft Maintenance and Engineering.** The development of knowledge an skill in organization, leadership and exercise of command, air operation, supply transportation, aircraft maintenance and engineering. I; 3. Prerequisite: Air Forc Science 114, or equivalent as determined by head of department and institution. Onl students pursuing a degree in engineering will be eligible. ADKINS.

226. **Junior Aircraft Maintenance and Engineering.** Continuation of Air Force Scienc 225, to include aircraft maintenance and engineering in such subjects as electricity propellers, hydraulic and pneumatic systems, structures, and miscellaneous. II; 3. Pre requisite: Air Force Science 225, or equivalent as determined by head of departmen and institution. ADKINS.

227. **Senior Aircraft Maintenance and Engineering.** Continuation of Air Force Scienc 226, to include Air Force management, Air Force teaching methods and administra tion. I; 3. Prerequisite: Air Force Science 226, or equivalent as determined by hea of department and institution. ADKINS.

228. **Senior Aircraft Maintenance and Engineering.** Continuation of Air Force Scienc 227, to include inspector general, career development, Air Force supply, and aircraf maintenance subjects such as organizational and field maintenance, aircraft engin operation and conditioning, cruise control, air inspector and test flights. II; 2. Pre requisite: Air Force Science 227, or equivalent as determined by head of departmen and institution. ADKINS.

231. **Junior Flight Operations.** This course is designed to provide instruction which wil facilitate and materially augment the academic phases of training in the Flyin Schools of the Air Training Command. The subjects include air operations, majo air commands, theory of flight, introduction to instruments, and a short genera course on elementary supply procedures and administrative publications. I; 3. Pre requisite: Air Force Science 114, or equivalent as determined by head of depart ment and institution. STARNES.

**32. Junior Flight Operations.** Continuation of Air Force Science 231, to include sixty theory hours divided equally among aircraft engineering, navigation, and meteorology. II; 3. Prerequisite: Air Force Science 231, or equivalent as determined by head of department and institution. STARNES.

**33. Senior Flight Operations.** Continuation of Air Force Science 232, to include Air Force management, teaching methods, administration, and military law and boards. I; 2. Prerequisite: Air Force Science 232, or equivalent as determined by head of department and institution. STARNES.

**34. Senior Flight Operations.** Continuation of Air Force Science 233. This course is designed to offer advanced instruction in navigation and bombing to include theory of radar as applied to both. A general study of the duties of electronic countermeasures officer and radar observer will be made. II; 3. Prerequisite: Air Force Science 233, or equivalent as determined by head of department and institution. STARNES.

**35. Junior General Technical.** This option offers training for duty in selected job areas in the United States Air Force: research and development; electronics; weapons; installations; and other specialized technical fields. Background in science, mathematics, or engineering is required. Study consists of scientific methods, technical career fields, atomic theory, guided missiles, and other selected technical subjects. Four hours of theory plus one hour of laboratory in leadership, drill and exercise of command. I; 3. Prerequisite: Air Force Science 114 or equivalent; registration in science, mathematics, or engineering major. JEMISON.

**36. Junior General Technical.** A continuation of Air Force Science 235. Four hours of theory plus one hour of laboratory in leadership, drill and exercise of command. II; 3. Prerequisite: Air Force Science 235. JEMISON.

**37. Senior General Technical.** World technological needs and resources; laboratory and shop management; function of technical specialists; physiological aspects of flying; transonic and supersonic flight; bacteriological warfare; and other new developments. Four hours of theory plus one hour of laboratory in leadership, drill and exercise of command. I; 3. Prerequisite: Air Force Science 236. JEMISON.

**38. Senior General Technical.** A continuation of Air Force Science 237. Four hours of theory plus one hour of laboratory in leadership, drill and exercise of command. II; 3. Prerequisite: Air Force Science 237. JEMISON.

## ANIMAL SCIENCE

**(Including Animal Nutrition)**

*Professors:* L. E. CARD (Head of Department), R. C. ASHBY (Emeritus), S. BULL, W. E. CARROLL (Emeritus), J. L. EDMONDS, H. S. GRINDLEY (Emeritus), T. S. HAMILTON, B. C. JOHNSON, W. G. KAMMLADE, H. H. MITCHELL, A. V. NALBANDOV, E. ROBERTS, H. P. RUSK, H. G. RUSSELL, H. M. SCOTT, R. R. SNAPP.

*Associate Professors:* H. W. BEAN, R. M. FORBES, U. S. GARRIGUS, A. L. NEUMANN, S. W. TERRILL.

*Assistant Professors:* D. E. BECKER, G. R. CARLISLE, C. W. CRAWFORD, W. H. HALE, MARIAN F. JAMES, S. F. RIDLEN, G. WOLF.

*Instructors:* R. C. EATON, MARJORIE EDMAN.

*Assistants:* W. W. ALBERT, M. H. BERT, J. W. A. BRANT, L. L. BUCY, EVA M. COHN, ALICE M. COOK, LUCILE DEKKER-VAN GHYL, R. M. EDWARDS, UVA G. FREY, E. A. GOFFI, W. T. HAINES, E. W. HARTSOOK, E. E. HATFIELD, H. M. HICKMAN, R. HOLLANDBECK, L. H. HORN, JR., T. M. HUSTON, J. M. IACONO, K. W. KEANE, MARGARET B. KEANE, MARY H. KEITH (Emerita), I. D. KEMP, P. KIVALO, W. KORNFELD, PEI-HSING LIN, R. J. MEADE, S. P. MISTRY, W. W. MOORE, T. S. NELSON, JANET L. PAGE, M. W. PASVOGEL, C. V. ROSS, H. E. SCHENDEL, ELIZABETH E. SCHOEN, H. V. SHIRLEY, JR., J. T. SIME, D. E. ULLREY, D. A. VAUGHAN, J. A. WELCH, R. P. WILCOX.

## Animal Science

### COURSES FOR UNDERGRADUATES

**101. Introduction to Animal Science.** Elementary livestock judging. Required of all students in the curriculum in general agriculture. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. CRAWFORD and others.

**102. Principles of Feeding.** Composition of feeds and of animal products; manurial value of feeds; how the animal utilizes feed; balancing rations. I, II; 3. Prerequisite: Chemistry 101 or 102. BULL and others.

**103. Breeds and Market Classes of Livestock.** Principles of selecting and judging market and breeding classes of beef cattle, horses, sheep, and swine. Characteristics and history of major breeds of livestock. Lectures, demonstrations, and practice judging I; 5. Prerequisite: Animal Science 101, or equivalent, or junior standing. SNAPP and others.

**104. Selection and Use of Meat.** Physical and chemical composition; nutritive value; selection and utilization of cuts. Lectures and demonstrations. I; 2. BULL.

**110. Plant and Animal Genetics.** Same as Agronomy 110, Dairy Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104. ALEXANDER, DAYTON, ROBERTS, TOUCHBERRY.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Livestock Management.** The development and importance of the livestock industry. The economic advantages of the various classes of farm animals and their relation to farm management. Selection and systems of breeding as used by successful breeders. Special lectures and demonstrations of caretakers' skills. II; 3. Prerequisite: Animal Science 102. EDMONDS.

**202. History of Breeds of Livestock.** In addition to lectures, discussions, and assigned reading dealing with the historical development of the various breeds, some judging practice will be used to illustrate different breed types. It is recommended that this course precede Animal Science 203. II; 3. Prerequisite: Animal Science 103. NEUMANN.

**203. Advanced Livestock Judging.** The team to represent the University in the Annual Intercollegiate Student Judging Contest will be chosen from the students in this class. I; 3. Prerequisite: Animal Science 103; Animal Science 202 is recommended. NEUMANN and others.

**204. Farm Meats.** Slaughter, grading, cutting, and processing of meats. An inspection trip will be made to the Chicago Stock Yards and packing plants; estimated expense, $15. II; 3. Prerequisite: Animal Science 104. KEMP.

**205. Meat Judging and Grading.** The team to represent the University in the Annual Intercollegiate Student Judging Contest will be chosen from the students in this class. I; 2. Prerequisite: Animal Science 104 or 204. KEMP.

**206. Light and Heavy Horses.** Breeds, management, judging. II; 3. Prerequisite: Animal Science 102, or junior standing. CRAWFORD, EDMONDS.

**207. Selection, Judging, and Grading of Poultry and Poultry Products.** Selection of breeding stock on the basis of egg production and breed characteristics; commercial grading and inspection of market eggs and poultry. The team to represent the University in the Annual Intercollegiate Student Poultry Judging Contest will be chosen from the students taking or having had this course. I; 3. Prerequisite: Animal Science 304. Offered in 1952-1953 and in alternate years. EATON.

209. **Special Problems.** I, II; 3 to 5. Prerequisite: Senior standing; approval of head of department. Bull, Card, Edmonds, Forbes, Garrigus, Hamilton, Nalbandov, Roberts, Scott, Snapp, Terrill.

#### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Beef Production.** The principles of feeding and management of beef cattle; financial aspects of beef production; diseases and parasites of beef cattle; fitting cattle for show and sale. Lectures and discussions. I, II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. Snapp.

302. **Sheep Production.** The sheep and wool industries; principles and practices of various phases of production. II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. Garrigus, Hale.

303. **Pork Production.** The place of the swine enterprise on the farm; selecting, breeding, feeding, managing, and marketing of swine for greatest profit. I, II; 3 hours, or ½ unit. Prerequisite: Animal Science 102. Terrill.

304. **Poultry Management.** Poultry science and practice with special reference to the place of the poultry enterprise on Illinois farms. Students may register for 3 hours credit without laboratory or for 4 hours credit with laboratory. I, II; 3 or 4 hours, or ½ unit. Prerequisite: Animal Science 102. Scott.

## Animal Nutrition

#### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Introduction to Animal Nutrition.** For students whose major is not animal nutrition, but who desire an introduction to the principles and practical applications of the science to animal feeding. II; 3 hours, or ½ unit. Prerequisite: Animal Science 102; Chemistry 132. Forbes.

## Anthropology

(See Sociology and Anthropology)

# ARCHITECTURE

*Professors:* T. C. Bannister (Head of Department), O. S. Fjelde, G. Guevrekian, G. S. Keith, W. S. Kinne, Jr., A. K. Laing, J. T. Lendrum, F. M. Lescher (Emeritus), D. B. Lindsay, E. I. Love, N. D. Morgan, R. Newcomb, C. E. Palmer, L. H. Provine (Emeritus), A. M. Richardson, E. F. Toth, A. R. Williams.

*Associate Professors:* R. A. Jones, T. E. O'Donnell (Emeritus), R. J. Smith, J. W. Wood.

*Assistant Professors:* J. S. Baker, J. M. Barrow, G. T. Clayton, E. M. Farnham (on leave), W. M. Johnson, R. M. Line, R. P. Link, C. B. Looker, F. D. Miles, J. A. Prestridge, Jr.

*Research Associate:* G. C. Winterowd.

*Instructors:* B. D. Brinkworth, F. P. Brotherton, H. C. Edwards, J. R. McGhee (on leave), J. G. Replinger.

*Visiting Lecturer:* F. J. Kornacker.

*Assistants:* Sydney B. Berry, J. P. Eberhard, R. D. Field, A. A. Hale, Jr., J. M. King, T. H. Klausmeyer, F. T. Kubitz, A. M. McHenry, R. W. Mayne, D. K. Pyle, R. S. Rose, W. H. Rump, J. A. Scheeler, J. E. Severns, E. J. Velardi, J. D. Woods.

### COURSES FOR UNDERGRADUATES

**101. Introduction to Architecture.** An introduction to the building industry and the profession of architecture; exercises illustrating basic architectural forms and their organization. I, II; 3. FJELDE and others.

**113. History of Ancient Architecture.** A description and analysis of the development of the architecture of the ancient East, Greece, and Rome, related to the environmental and cultural setting. I, II; 2. Prerequisite: Architecture 131, or sophomore standing. EDWARDS.

**131. Architectural Design.** Beginning study of architectural planning and designing. Fundamentals of sketching and presentation. I, II; 3. Prerequisite: Architecture 101. FJELDE, LINE, and others.

**132. Architectural Design.** Continuation of the fundamentals of architectural design. I, II; 3. Prerequisite: Architecture 131, or consent of instructor. FJELDE, REPLINGER, and others.

**133. Architectural Design.** Continued study of architectural planning and designing; principles of plan, elevation, and section in small buildings. I, II; 3. Prerequisite: Architecture 132. BARROW, BROTHERTON, MILES, REPLINGER, and others.

**134. Architectural Design.** Continuation of Architecture 133. I, II; 3. Prerequisite: Architecture 133. BARROW, BROTHERTON, MILES, and others.

**141. Materials and Methods of Construction I.** Wood frame construction as used in houses; manufacture and performance characteristics of materials; framing systems; typical details; finishing materials. I, II; 2. Prerequisite: Registration in Architecture 131. CLAYTON, KINNE, and others.

**142. Materials and Methods of Construction II.** Non-fire resistance construction; manufacture and performance characteristics of materials; support systems; typical details; finishing materials. I, II; 2. Prerequisite: Architecture 141. CLAYTON, KINNE, and others.

**143. Materials and Methods of Construction III.** Fire resistant construction; manufacture and performance characteristics of materials; support systems; typical details, finishing materials. I, II; 2. Prerequisite: Architecture 142. CLAYTON, KINNE, and others.

**144. Materials and Methods of Construction IV.** Modular dimensioning; prefabrication; thermal and sound insulation; industrial structures; wide span systems; architectural acoustics. I, II; 2. Prerequisite: Architecture 143. CLAYTON, KINNE, and others.

**171. Drawing Theory.** Orthographic, oblique, isometric projections and perspective. Not open to students expecting a degree in architecture. I, II; 2. Students with 94 or more credit hours receive only one hour credit. BRINKWORTH, JOHNSON, WALLACE.

**172. Drawing Theory.** Continuation of Architecture 171. Orthographic, oblique, isometric projections and perspective. Not open to students expecting a degree in architecture. I, II; 2. Students with 94 or more credit hours receive only one hour credit. Prerequisite: Architecture 171. BRINKWORTH, JOHNSON, WALLACE.

**173. Fundamentals of Drafting and Drawing for Occupational Therapy.** Primarily for students in occupational therapy. Drawing techniques, lettering, projections, perspective, and special problems. I, II; 3. JOHNSON.

**175. Frame Construction Details.** Primarily for students in landscape architecture. Not open to students working toward a degree in architecture. I; 2. Prerequisite: Consent of instructor. CLAYTON.

**176. Masonry Construction Details.** Primarily for students in landscape architecture. Not open to students working toward a degree in architecture. II; 2. Prerequisite: Architecture 175, or consent of instructor. CLAYTON.

## COURSES FOR ADVANCED UNDERGRADUATES

**114. History of Medieval Architecture.** A description and analysis of the development of medieval architecture in Europe and the East related to the environmental and cultural setting. I, II; 3. Prerequisite: Architecture 113, or consent of instructor. LAING.

**115. History of Renaissance and Baroque Architecture.** A description and analysis of the development of Renaissance and Baroque architecture related to the environmental and cultural setting. I, II; 3. Prerequisite: Architecture 214, or consent of instructor. EDWARDS.

**116. Modern Architecture.** A description and analysis of the development of architecture in Europe and America from 1790 to the present day, related to the environmental and cultural setting, and especially the impact of science and technology. I, II; 3. Prerequisite: Architecture 215, or consent of instructor. LAING.

**135. Architectural Design.** Principles of site planning, group planning, and studies of other contemporary architectural problems. I, II; 5. Prerequisite: Architecture 134. BAKER, LOOKER, PRESTRIDGE, SMITH.

**136. Architectural Design.** Principles of site planning, group planning, and studies of other contemporary architectural problems. I, II; 5. Prerequisite: Architecture 235. BAKER, LOOKER, PRESTRIDGE, SMITH.

**144. Working Drawings.** The preparation of working drawings for the construction of buildings; outline specifications; cost estimates. I, II; 2. Prerequisite: Architecture 144. CLAYTON, KINNE, and others.

**145. Structural Elements.** Graphical and algebraic analysis of forces; centroids; moments of inertia; bending moments, shear, and deflection in beam design; truss loadings and stresses, kerns, pressures, shear, and moments in masonry structure. Use of handbooks. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150 or 171. KORNACKER, LINK, and others.

**146. Theory of Structural Design.** Analysis and design of timber trusses, riveted steel trusses, welded steel trusses, timber floor panels, steel floor panels, columns, plate girders, trussed beams, and application problems from actual professional practice. Use of handbooks. I, II; 3. Prerequisite: Architecture 245. TOTH and others.

**147. Structural Planning.** General problems in the selection and design of structural systems for buildings; methods of analysis; site exploration; foundations; bracing; special systems. I, II; 3. Prerequisite: Architecture 246. To be offered beginning 1953-1954.

**156. Building Sanitation.** Water supply and treatment; purification, pumping, and storage; piping and drainage systems; plumbing fixtures and their installation; plumbing design for special problems. I, II; 2. Prerequisite: Junior standing in architecture. CLAYTON.

**157. Reinforced Concrete Theory.** Principles of reinforced concrete construction; theory of design of structural elements. I, II; 3. Prerequisite: Architecture 246. PALMER.

**155. Theory of Architecture.** The principles of planning and composition in architectural design. I, II; 2. Prerequisite: Architecture 134. LOOKER, PRESTRIDGE.

**158. Specifications.** Lectures and discussions of specifications for buildings; supplementary and general conditions of the contract; detailed specifications; supervision and superintendence; building laws and codes. I, II; 3. Prerequisite: Senior standing in architecture. KINNE.

**183. Architectural Practice.** Discussion of professional ethics and problems confronting the architect in the conduct of his business; procedure and control of work in the office and in the field; methods of making architectural estimates; contracts and contract documents; awarding of contracts. I, II; 2. Prerequisite: Senior standing in architecture. KINNE.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**337. Architectural Design.** Advanced problems in modern buildings and building grou with more complex requirements. I, II; 7 hours, or 1½ units. Prerequisite: Archite ture 236; senior standing in architecture. Guevrekian, Keith, Lindsay, William Wood.

**338. Architectural Design.** Advanced problems in modern buildings and building grou with complex requirements. I, II; 7 hours, or 1½ units. Prerequisite: Architectu 337; senior standing in architecture. Guevrekian, Keith, Lindsay, Williams, Woo

**347. Theory of Structures.** Analysis of framework; industrial buildings; churches; arche deflections; elastic theory. I, II; 5 hours, or 1 unit. Prerequisite: Architecture 24 Theoretical and Applied Mechanics 221; credit or registration in Architecture 25 Kornacker, Link.

**348. Advanced Structures.** Theaters, assembly halls, and high buildings; continuous bean and trusses; rigid frames; statically indeterminate structures. I, II; 5 hours, or 1 uni Prerequisite: Architecture 347; credit or registration in Architecture 358. Morgan.

**358. Reinforced Concrete Design.** Reinforced concrete building design; analysis of vario types of modern fireproof construction. I, II; 3 hours, or ½ unit. Prerequisite: Arch tecture 257; credit or registration in Architecture 348. Morgan.

## ART

*Professors:* A. S. Weller (Head of Department), L. Bailey, C. E. Bradbury, C. V Donovan, J. D. Hogan, R. J. Roos, J. R. Shipley.
*Associate Professors:* C. A. Dietemann, W. F. Doolittle, J. W. Kennedy, M. J Martin, A. J. Pulos, E. C. Rae, H. A. Schultz, Louise M. Woodroofe.
*Assistant Professors:* C. W. Briggs, N. Britsky, L. R. Chesney, R. L. Drummond, R. I Hult, J. W. Raushenberger, M. A. Sprague, N. V. Ziroli.
*Instructors:* E. H. Betts, E. J. Bransby, G. N. Foster, R. A. Ginstrom, J. H. C Lynch, R. Perlman, Bacia Stepner, L. Zamiska.
*Assistants:* Alice A. Boatright, Mary A. Chenoweth, M. J. Cohen, R. J. Dudle R. E. Marx, R. W. Schlageter, J. E. Schwarz, D. L. Weygandt, E. J. Wolfle

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major in the History of Art:** Twenty hours in art, excluding Art 185 and 186. Th major must include Art 111, 112, 188, and 189, and at least ten hours chosen from A 311, 312, 313, 314, 315, 316, 317, 318.

**Minor:** Twenty hours in any one or two of the subjects which follow: English, Greel history, Latin, philosophy, psychology, sociology and anthropology, and speech. At lea eight hours must be taken in each subject if two are chosen. The minor may also be take in the curriculum in medieval civilization or the curriculum in Latin-American studie

### COURSES FOR UNDERGRADUATES

**101. Water Color.** Still life and outdoor sketching. I, II; 2. Prerequisite: Art 122. Ken nedy.

**102. Water Color.** Still life and outdoor sketching. I, II; 2. Prerequisite: Art 101. Ken nedy.

**104. Interior Design.** I or II; 2. Prerequisite: Art 131 or 133, or registration in Art 18 Schultz.

**105. Introduction to Water Color Painting.** Elementary water color sketching from land scape. Not open to students majoring in art. S; 2. Britsky.

106. **Introduction to Oil Painting.** Elementary oil painting and sketching from still life and landscape. Not open to students majoring in art. S; 2. BRITSKY.

107. **Elementary Drawing.** Practical problems in elementary drawing as applied to solids, line drawing, light and shade, outdoor and studio sketching. Not open to students majoring in art. S; 1. RAUSHENBERGER.

108. **Introduction to Advertising Design.** Practical methods of lettering and layout. Primarily for public school teachers and students in commerce and journalism. Not open to students majoring in art. S; 2. PERLMAN.

109. **Introduction to Three-Dimensional Design.** Experimental problems in space, motion, and materials. Not open to students majoring in art. S; 2. ZIROLI.

110. **Elementary Design.** Exercises in elementary design with emphasis on the practical application of the principles of design. Not open to students majoring in art. S; 1. RAUSHENBERGER.

111. **Introduction to Ancient and Medieval Art.** Cultural analysis of the interrelated fields of architecture, sculpture, painting, and other humanistic studies previous to the Italian Renaissance. I; 3. Prerequisite: Sophomore standing. RAE.

112. **Introduction to Renaissance and Modern Art.** Cultural analysis of the interrelated fields of architecture, sculpture, painting, and other humanistic studies beginning with the Italian Renaissance and continuing through the modern period. II; 3. Prerequisite: Sophomore standing. RAE.

115. **Art Appreciation.** An introduction to the factors inherent in architecture, sculpture, painting, and other arts. Primarily for non-art students. I, II; 3. Prerequisite: Sophomore standing. ROOS.

117. **Drawing.** Theory and practice in the elements of drawing. I, II; 3.

118. **Drawing.** Theory and practice in the elements of drawing. I, II; 2. Prerequisite: Art 117.

119. **Design.** Theory and practice in the elements of design. I, II; 2.

120. **Design.** Theory and practice in the elements of design. I, II; 3. Prerequisite: Art 119.

123. **Life Drawing and Anatomy.** Construction of the figure in charcoal; study of the head from life; figure sketching; and lectures on anatomy. I, II; 5. Prerequisite: Art 122. BAILEY, BRADBURY, BRIGGS, HULT, SPRAGUE, and others.

124. **Life Drawing and Anatomy.** Construction of the figure in charcoal; study of the head from life; figure sketching; and lectures on anatomy. I, II; 5. Prerequisite: Art 123. BAILEY, BRADBURY, BRIGGS, HULT, SPRAGUE, and others.

125. **Life Drawing.** I, II; 2. Prerequisite: Art 122. BAILEY.

126. **Life Drawing.** I, II; 2. Prerequisite: Art 125. BAILEY.

131. **Elementary Composition.** Pictorial composition in line, pattern, and color. I, II; 2. Prerequisite: Sophomore standing in art. FOSTER, ZIROLI.

132. **Elementary Composition.** Pictorial composition in line, pattern, and color. I, II; 2. Prerequisite: Sophomore standing; Art 131. FOSTER, ZIROLI.

133. **Design Workshop.** Fundamentals of three-dimensional design. Primarily for students in the industrial design curriculum. I, II; 2. Prerequisite: Art 122. PULOS.

134. **Design Workshop.** Fundamentals of three-dimensional design. Primarily for students in the industrial design curriculum. I, II; 2. Prerequisite: Art 133. PULOS.

137. **Design Analysis.** Furniture, interior architecture, industrial products, and other art forms critically evaluated in terms of function, structure, material, esthetic quality,

and appropriateness; procedure and methods of design. Primarily for students in engineering and industrial education. I; 2. Prerequisite: Sophomore standing or consent of instructor. SHIPLEY.

141. **Still Life.** Painting in oil from arranged groups. I, II; 2. Prerequisite: Art 125. HOGAN, KENNEDY, ZIROLI.

142. **Still Life.** Painting in oil from arranged groups. I, II; 2. Prerequisite: Art 141. HOGAN, KENNEDY, ZIROLI.

145. **Casein and Tempera Painting.** Painting in tempera or casein of compositional arrangements of either the figure or landscape. I, II; 2. BAILEY.

146. **Casein and Tempera Painting.** Painting in tempera or casein of compositional arrangements of either the figure or landscape. I, II; 2. Prerequisite: Art 145. BAILEY.

150. **Sculpture.** Anatomical and ornamental forms. Open to students in other colleges. I, II; 2. Prerequisite: Consent of instructor. FOSTER, MARTIN.

151. **Sculpture.** Anatomical and ornamental forms; plaster molds and models; wood and stone sculpture. I, II; 2. Prerequisite: Art 122. MARTIN.

152. **Sculpture.** Anatomical and ornamental forms; plaster molds and models; wood and stone sculpture. I, II; 2. Prerequisite: Art 151. MARTIN.

170. **Recreational Crafts.** Introduction to design and execution in crafts particularly adapted to work with children in schools, playgrounds, and summer camps. Primarily for recreation majors in physical education for men. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. DRUMMOND, GINSTROM.

171. **Metalwork and Jewelry I.** A course in the design and execution of simple jewelry, flatware, and hollow ware, including study of the characteristics of base and precious metals and stones and working experience in the basic forming, decorating, joining and finishing processes. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. PULOS.

172. **Metalwork and Jewelry II.** Advanced work in the design and production of jewelry, flatware, and hollow ware with emphasis on the development of related or more complicated pieces. Manipulative techniques are expanded and experimentation with materials and processes is encouraged. I, II; 2. Prerequisite: Art 171. PULOS.

173. **Pottery I.** A course in the design and production of pottery by hand methods. Work will cover the basic processes of forming, decorating, and firing. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

174. **Pottery II.** A course in advanced work in studio pottery, including expanded experience in forming methods and glaze compounding. I, II; 2. Prerequisite: Art 173. STEPNER.

175. **Leatherwork I.** A course in the design and execution of simple projects in leather. Characteristics of leather and their uses will be studied as well as forming, decorating and finishing processes. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

176. **Leatherwork II.** Advanced work in the design and production of leather projects. Work will be concentrated on larger and more complicated work. I, II; 2. Prerequisite: Art 175. STEPNER.

177. **Bookbinding I.** A course in the design and execution of simple projects in portfolio bookbinding, printing, and stenciling. I, II; 2. Prerequisite: Sophomore standing, or consent of instructor. STEPNER.

178. **Bookbinding II.** Advanced work in bookbinding. Projects in decorating and finishing. I, II; 2. Prerequisite: Art 177. STEPNER.

181. **Freehand Drawing.** Simple groups of block form, still life, and casts in pencil and charcoal. Primarily for students in architecture. I, II; 2. BETTS, BRITSKY, DUDLEY

182. **Freehand Drawing.** Simple groups of block forms, still life, and casts in pencil and charcoal. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 181. BETTS, DUDLEY, WEYGANDT.

183. **Freehand Drawing.** Charcoal drawing from the cast; water color. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 182. BETTS, BRANSBY, COHEN, HULT.

184. **Freehand Drawing.** Charcoal drawing from the cast; water color. Primarily for students in architecture and landscape architecture. I, II; 2. Prerequisite: Art 183. BETTS, BRANSBY, COHEN, HULT.

185. **Design.** Composition in line, pattern, monochrome, and color. For home economics students. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. DRUMMOND, SCHWARZ.

186. **Design.** Composition in line, pattern, monochrome, and color. For home economics students. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Art 185. DRUMMOND and others.

188. **Introduction to Art Form.** I, II; 2. BOATRIGHT, GINSTROM.

189. **Introduction to Art Form.** I, II; 2. Prerequisite: Art 188. BOATRIGHT, GINSTROM.

### COURSES FOR ADVANCED UNDERGRADUATES

201. **Water Color.** I, II; 2. Prerequisite: Art 102. KENNEDY.

202. **Water Color.** I, II; 2. Prerequisite: Art 201. KENNEDY.

203. **Art Education Laboratory.** Art in the elementary school. Creative activities in a variety of art materials appropriate for use in the first eight grades of the public school. Class discussion on teaching techniques. Notebook required. I, II; 2. Prerequisite: Art 132, or junior standing. DRUMMOND, SCHULTZ.

204. **Art Education Laboratory.** Art in the secondary school. Creative activities in a variety of art materials appropriate for use in the high school. Class discussion on teaching techniques. Notebook required. II; 2. Prerequisite: Art 132, or junior standing. SCHULTZ.

211. **History of Art in Industry.** Analysis of applied art in crafts; industrial procedure from early antiquity to the present. Inspection trip required. II; 2. SHIPLEY.

221. **Life Drawing and Portrait.** Drawing from figure in full scale; quick action poses and techniques of sketching in various media; painting from the head. I, II; 5. Prerequisite: Art 124. BRADBURY, HOGAN.

222. **Life Drawing and Portrait.** Monochrome painting from figure in full scale; quick action poses and techniques of sketching in various media; painting from the head. I, II; 5. Prerequisite: Art 221. BRADBURY, HOGAN.

223. **Figure Drawing and Sketch.** Primarily for students in the advertising design curriculum. I, II; 3. Prerequisite: Art 124. KENNEDY.

224. **Figure Drawing and Sketch.** Primarily for students in the advertising design curriculum. I, II; 3. Prerequisite: Art 223. KENNEDY.

231. **Intermediate Composition.** I, II; 3. Prerequisite: Art 132. WOODROOFE.

232. **Intermediate Composition.** I, II; 3. Prerequisite: Art 231. WOODROOFE.

233. **Advanced Composition.** I, II; 4. Prerequisite: Art 232. DOOLITTLE.

234. **Advanced Composition.** I, II; 4. Prerequisite: Art 233. DOOLITTLE.

235. **Illustration.** Problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 132. DIETEMANN.

236. **Illustration.** Problems in the design and execution of book and magazine illustration I, II; 2. Prerequisite: Art 235. DIETEMANN.

237. **Advanced Illustration.** Advanced problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 236. DIETEMANN.

238. **Advanced Illustration.** Advanced problems in the design and execution of book and magazine illustration. I, II; 2. Prerequisite: Art 237. DIETEMANN.

241. **Life Painting.** Work from posed model in natural scale. I, II; 4. Prerequisite: Art 222. BRADBURY.

242. **Life Painting.** Work from posed model in natural scale. I, II; 4. Prerequisite: Art 241. BRADBURY.

251. **Advanced Sculpture.** I, II, 2. Prerequisite: Art 152. MARTIN.

252. **Advanced Sculpture.** I, II; 2. Prerequisite: Art 251. MARTIN.

255. **Graphic Arts.** A laboratory course in etching, lithography, and other graphic media. Work will include the complete development of each medium, from sketch to printing stages. I, II; 2. Prerequisite: Junior standing in art or consent of instructor. CHESNEY, DUDLEY.

256. **Graphic Arts.** A laboratory course in etching, lithography, and other graphic media. Work will include the complete development of each medium, from sketch to printing stages. I, II; 2. Prerequisite: Art 255. CHESNEY, DUDLEY.

261. **Layout and Lettering.** Application of design, lettering, and layout for industrial purposes. I, II; 3. Prerequisite: Junior standing in art. PERLMAN, ZAMISKA.

262. **Layout and Lettering.** Application of design, lettering, and layout for industrial purposes. I, II; 3. Prerequisite: Art 261. PERLMAN, ZAMISKA.

265. **Advertising Design.** Methods of drawing and painting for commercial purposes. I, II; 3. Prerequisite: Junior standing in art. PERLMAN.

266. **Advertising Design.** Methods of drawing and painting for commercial purposes. I, II; 3. Prerequisite: Art 265. PERLMAN.

267. **Advanced Advertising Design.** I, II; 5. Prerequisite: Art 266. DONOVAN, PERLMAN.

268. **Advanced Advertising Design.** I, II; 5. Prerequisite: Art 267. DONOVAN, PERLMAN.

271. **Materials and Processes.** Use and manipulation of basic materials in modern industry. I, II; 2. Prerequisite: Junior standing in art. PULOS.

272. **Materials and Processes.** Use and manipulation of basic materials in modern industry. I, II; 2. Prerequisite: Art 271. PULOS.

275. **Industrial Design.** Designing of objects for manufacture by the machine industries. I, II; 3. Prerequisite: Junior standing in art. SHIPLEY.

276. **Industrial Design.** Designing of objects for manufacture by the machine industries. I, II; 3. Prerequisite: Art 275. SHIPLEY.

277. **Advanced Industrial Design.** I, II; 5. Prerequisite: Art 276. SHIPLEY.

278. **Advanced Industrial Design.** I, II; 5. Prerequisite: Art 277. SHIPLEY.

281. **Freehand Drawing.** Arrangement of form and color; rhythm and sequence, harmony, and contrast; charcoal, pen, pencil, and water color drawing from cast and still life; outdoor sketching. Primarily for students in architecture. I, II; 2. Prerequisite: Art 184. BRANSBY, BRITSKY, SPRAGUE, WOODROOFE, ZAMISKA.

282. **Freehand Drawing.** Arrangement of form and color; rhythm and sequence, harmony, and contrast; charcoal, pen, pencil, and water color drawing from cast and

still life; outdoor sketching. Primarily for students in architecture. I, II; 2. Prerequisite: Art 281. Bransby, Britsky, Sprague, Woodroofe, Zamiska.

83. **Freehand Drawing.** Figure drawing from cast and life. Primarily for students in architecture. I, II; 2. Prerequisite: Art 282. Bailey, Britsky, Lynch.

84. **Freehand Drawing.** Figure drawing from cast and life. Primarily for students in architecture. I, II; 2. Prerequisite: Art 283. Bailey, Britsky, Lynch.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

311. **Classical Art.** Architecture, painting, sculpture, and minor arts of the Greek and Roman periods. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1952-1953 and in alternate years. Rae.

312. **Medieval Art.** Architecture, painting, sculpture, and minor arts of the Romanesque and Gothic periods. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. Rae.

313. **Italian Renaissance Art.** Architecture, painting, sculpture, and minor arts of Italy during the Renaissance. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. Weller.

314. **Northern Renaissance Art.** Architecture, painting, sculpture, and minor arts of France, Germany, Spain, and England in the sixteenth, seventeenth, and eighteenth centuries. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. Weller.

315. **Art of the Nineteenth Century.** Architecture, painting, sculpture, minor arts of France, Germany, Spain, and England in the nineteenth century. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Offered in 1951-1952 and in alternate years. Roos.

316. **Art of the Twentieth Century.** Architecture, painting, sculpture, and minor arts of France, Germany, Spain, and England in the twentieth century. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Roos.

317. **American Art.** Architecture, painting, sculpture, and minor arts of the colonies and the United States. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Roos.

318. **Latin-American Art.** A study of the more important phases and periods of the visual arts of Latin America. I or II; 3 hours, or ¾ unit. Prerequisite: Art 111 and 112 for art students; junior standing or consent of instructor for others. Rae.

333. **Painting.** Advanced painting in oil and other media. Not open to candidates for the M.F.A. degree in painting. I, II; 2 hours, or ½ to 1 unit. Prerequisite: Art 142, or equivalent. Staff.

341. **Painting Materials and Techniques.** Study of the materials and techniques used in the various media: oil, water color, tempera, gouache, encaustic, etc. I or II; 2 hours, or ½ unit. Prerequisite: Art 142, or graduate standing in art. Kennedy.

351. **Advanced Sculpture Techniques.** Advanced work in various sculptural media. I, II; 2 hours, or ½ to 1 unit. Prerequisite: Art 252, or equivalent. Martin.

355. **Graphic Media.** Advanced work in various printmaking techniques. Not open to candidates for the M.F.A. degree in painting. I, II; 2 hours, or ½ to 1 unit. Prerequisite: Art 256, or equivalent. Chesney.

371. **Silversmithing I.** Design and execution of hollow ware, dealing primarily with raising and spinning methods and with the decorative processes of chasing, repousse, niello, filigree, and inlay. I, II; 2 hours, or ½ unit. Prerequisite: Art 172, or equivalent. PULOS.

372. **Silversmithing II.** Design and execution of flatware and hollow ware, dealing primarily with forging and seaming methods, engraving, and tool-making. I, II; 2 hours or ½ unit. Prerequisite: Art 371. PULOS.

## ASTRONOMY

*Professors:* G. C. MCVITTIE (Head of Department), R. H. BAKER (Emeritus).
*Assistant Professor:* R. G. LANGEBARTEL

### COURSES FOR ADVANCED UNDERGRADUATES

201. **Descriptive Astronomy.** The solar system. I, II; 3. Prerequisite: Junior standing. LANGEBARTEL.

202. **Descriptive Astronomy.** The stars. I, II; 3. Prerequisite: Junior standing. LANGEBARTEL.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

307. **Celestial Mechanics.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 142.

314. **Observational Astronomy.** Special problems. S; 2 or 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor.

## AVIATION

*Professor:* L. A. BRYAN (Director of Institute of Aviation).
*Instructors:* G. L. AMUNDSON, L. B. APPLEGATE, E. J. BRUNNER, D. J. CAMERON, E. A. CUSHMAN, M. R. GREEN, L. C. HARRISON, J. L. MCGLONE, G. A. MOSELEY, L. P. NELSON, BERNICE SCHRADER, H. C. SEIWERT, K. R. STONE, J. W. STONECIPHER, L. E. WILKERSON.

### COURSES FOR UNDERGRADUATES

NOTE: Aviation 102 and 103, or 103 and 104 may be taken concurrently.

101. **Private Pilot Course.** Prepares the beginning flight student for a Civil Aeronautics Administration Private Pilot rating. Airplane utility is emphasized. Forty-eight classroom hours of preflight (ground school) work on Civil Air Regulations, aerial navigation, radio, meteorology, and general service of aircraft; thirteen hours of flight discussion; eleven hours of Link training; and thirty-eight hours of flight training in various makes of airplanes. I, II; 3. AMUNDSON, STONECIPHER, and others.

102. **Secondary Flight Training.** Continuation of the training of the Private Pilot. The purpose is to develop further the qualities of a good pilot. Aerobatics are emphasized. Additional ground school training in meteorology and aircraft engines is presented. Forty-eight classroom hours of preflight (ground school) study and forty-four hours of flight training (sixteen dual and twenty-eight solo) in side-by-side monoplanes and two-place tandem biplanes. I, II; 3. Prerequisite: Aviation 101, or possession of Private Pilot rating; consent of Director of Institute. AMUNDSON and others.

**103. Intermediate Flight Training.** The third phase of flight training in preparation for a Civil Aeronautics Administration Commercial Pilot rating. Emphasis is placed on cross-country, night, and instrument flying. Forty-eight classroom hours of preflight (ground school) work in radio, aerial navigation, and use of the E-6B computer; and forty-four hours of flight training (seventeen dual and twenty-seven solo) in two-place side-by-side radio-equipped aircraft and two-place tandem monoplanes. I, II; 3. Prerequisite: Aviation 101, or possession of Private Pilot rating. AMUNDSON and others.

**104. Advanced Flight Training.** The final phase of flight training in preparation for a Civil Aeronautics Administration Commercial Pilot rating. Emphasis is placed on precision flying. Forty-eight classroom hours of preflight (ground school) work are devoted to aircraft and a review of Civil Air Regulations, aerial navigation, meteorology, aircraft engines, and radio aids to navigation in preparation for written and flight phases of the C.A.A. examination for a Commercial Pilot rating. Forty-four hours of flight training (fourteen dual and thirty solo) in two-place tandem monoplanes or four-place monoplane. I, II; 3. Prerequisite: Aviation 103; consent of Director of Institute. AMUNDSON and others.

**150. Aircraft Engine Overhaul.** Engine removal; detailed procedure and practice in complete disassembly of engines; cleaning, inspecting, reworking, or replacing parts. Reassembly, installation in aircraft, and testing. II; 3. Prerequisite: Must have completed the first semester of the aircraft maintenance curriculum, or equivalent. NELSON.

**151. Applied Aircraft Physics.** Matter and measurements; liquid pressure; atmosphere and air pressure; theory of moments; laws of motion; heat and expansion; work, power, energy, and magnetic effects of electrical currents as they apply to aircraft. II; 3. CUSHMAN.

**152. Aircraft Engine Accessory Overhaul.** The disassembly of aircraft starters, generators, carburetors, magnetos, fuel pumps, and oil pumps. Cleaning, inspecting, repairing, and testing. II; 3. Prerequisite: Must have completed the first semester of the aircraft maintenance curriculum, or equivalent. MOSELEY.

**153. Aircraft Shop Practice.** The care and use of hand tools; use of taps and dies, lathes, drill presses, power saws, sprays, cleaners, and other shop equipment. I; 3. MOSELEY, NELSON.

**154. Aircraft Propellers.** The theory of and practical work on various types of propellers, both wood and metal. Inspection, removal, repair, balancing, and installation. II; 3. Prerequisite: Aviation 157. HARRISON.

**155. Aircraft Mathematics.** A mathematical course for aircraft mechanics with emphasis on the use of decimals, ratio and proportion, formulas, equations, areas, and horsepower calculations. I; 3. HARRISON.

**157. Aircraft Engine Theory and Practice.** Theory of operation of internal combustion engines. Construction and advantages of different types of aircraft engines. Practical work in disassembly, cleaning, inspection of parts; checking tolerances to specifications; reassembly; valve and ignition timing procedures. Starting systems, carburetion; fuel and lubrication; propellers. I; 6. HARRISON, MOSELEY, NELSON.

**158. Aircraft Overhaul.** The complete disassembly of the aircraft, cleaning, inspecting, corrosion and rust treatment, painting of frame, recovering or patching, rejuvenation, rigging, alignment, assembly, engine installation, weight and balance, and other necessary work to prepare the airplane for flight. II; 3. APPLEGATE.

**160. Aircraft Rigging and Assembly.** Installation, operation, servicing, repair, adjustment, and inspection of aircraft controls and control surfaces. II; 2. APPLEGATE.

**161. Airport Shop Management.** Shop safety, purchasing, record keeping, inventories, accounting, job estimates, and foremanship. I; 3. BRYAN.

**162. Aircraft Systems and Appliances.** The inspection, repair, replacement, and maintenance of hydraulic systems, actuating systems, landing gears, fuel, vacuum, and

oxygen systems. Practical work in the installation and maintenance of radios and instruments. II; 3. MOSELEY.

163. **Aircraft Woodworking.** Explanation of and instruction in the use and care of woodworking tools; the selection of materials used in aircraft construction; defects, drying, lumber storage, steam bending, laminating, gluing, testing, and inspection. Alterations and repairs will be performed to give practical experience. I; 2. APPLEGATE.

164. **Inspections, Forms and Reports.** Complete inspection following overhaul. Preflight, 25-hour, 100-hour, and annual inspections. Forms covering relicensing, bill of sale, repair, and alteration. Reports to Civil Aeronautics Administration and others. II; 3. APPLEGATE.

165. **Aircraft Welding.** The theory and practice of welding. Use of regulators, torches, tips, hose lines, gauges, valves, and oxygen and acetylene supplies. Knowledge of brazing and silver soldering. Use of jigs, trammels, levels, and protractors. I; 2. APPLEGATE.

167. **Aircraft Sheet Metal.** Sheet metal work on materials used in aircraft, classification of sheet metals, identification and characteristics, protective coatings, riveting, hand forming, stringer splicing, and general repairs. I; 2. CUSHMAN.

168. **Problems of Aircraft Maintenance.** Group discussions and reports on current problems of aircraft maintenance. II; 2. Prerequisite: Sophomore standing. APPLEGATE.

169. **Aircraft Materials and Specifications.** Proper identification of all the materials used in aircraft design and repair. A.N. specifications, S.A.E. and manufacturers' standards. I; 1. CUSHMAN.

171. **Aircraft Finishing Methods.** The materials and methods used in covering and doping, including the preparation of surfaces for finishings, proper methods of finishing, finishing pigmented dope, fabric rejuvenation, troubles in aircraft finishing and their prevention, the operation and care of finishing room equipment. I; 3. APPLEGATE.

### COURSES FOR ADVANCED UNDERGRADUATES

NOTE: Aviation 205 and 206 may be taken concurrently.

205. **Flight Instructor Course.** Prepares the Commercial Pilot for a Civil Aeronautics Administration Flight Instructor rating. Forty-eight classroom hours of preflight (ground school) work on techniques of flight instruction and theory of flight, and a minimum of twenty-six hours of flight training (twenty dual and six solo) in two-place tandem aircraft. I, II; 3. Prerequisite: Possession of Commercial Pilot rating; junior standing; consent of Director of Institute. STONECIPHER and others.

206. **Instrument Flight Course.** Prepares the Commercial Pilot for a Civil Aeronautics Administration Instrument rating. Forty-eight classroom hours of preflight (ground school) work on Civil Air Regulations, meteorology, aircraft and theory of flight, navigation, instruments, radio, and navigational aids, and instrument flight procedures, and twenty to thirty hours of instrument flight, and ten to twenty hours of Link training. I, II; 3. Prerequisite: Possession of Commercial Pilot rating; junior standing; consent of Director of Institute. STAFF.

210. **Aviation in the Modern World.** A survey of the social, political, economic, and international aspects of aviation as related to life in the modern world. I or II; 3. Prerequisite: Sophomore standing. BRYAN.

291. **Special Rating (Single-Engine Sea).** Prepares the Commercial Pilot for a Civil Aeronautics Administration Single-Engine Seaplane rating. Sixteen classroom hours of preflight (ground school) training and fifteen hours of flight training in a single-

engine seaplane. S; 1. Prerequisite: Commercial Pilot rating; consent of Director of Institute. STONECIPHER.

292. **Special Rating (Multi-Engine Land).** Prepares the Commercial Pilot for a Civil Aeronautics Administration Multi-Engine Land Airplane rating. Sixteen classroom hours of preflight (ground school) training and fifteen hours of flight training in a multi-engine land airplane. II; 1. Prerequisite: Commercial Pilot rating; consent of Director of Institute. STONECIPHER.

# BACTERIOLOGY

*Professors:* H. O. HALVORSON (Head of Department), I. C. GUNSALUS, S. E. LURIA, S. SPIEGELMAN, F. W. TANNER (on leave), G. I. WALLACE.
*Associate Professor:* F. M. CLARK.
*Assistant Professor:* A. F. BORG.
*Instructor:* E. JUNI.
*Assistants:* MARY K. BROWN, R. I. DEMARS, BARBARA P. ELLIOTT, F. T. GARDNER, D. C. GILLESPIE, MARION H. GILMOUR, E. F. HARRISON, L. KAPLAN, S. LEDERBERG, B. P. SAGIK, E. H. SCHULDT, D. C. WALDHALM, H. F. YARBROUGH.

## REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in bacteriology including Bacteriology 306 or equivalent; the remainder to be selected from courses given by the department. Dairy Science 350 will be acceptable in the major. Bacteriology 104 will not be counted in the 20 hours required for a major. Only those courses in the major subject passed with a grade of C or better will be counted toward the major.

**Minors:** Twenty hours chosen from not more than two of the following: botany, chemistry, entomology, mathematics, physics, physiology, and zoology. At least eight hours must be taken in each subject if two are chosen.

## RECOMMENDED SEQUENCE OF COURSES

Students who wish to major in bacteriology should start basic science courses early in their college training as a basis for the study of bacteriology, even though this may necessitate some delay of their courses in the languages, humanities, and social sciences. Chemistry, biology, mathematics, and physics should be included in the first two years of college.

A year of college biology, preferably including genetics; chemistry through quantitative analysis and organic; and mathematics through college algebra will be required. The sequence including Chemistry 124 and 234 is recommended; it should be completed, if possible, before the second semester of the junior year. A year of college physics and mathematics through calculus is recommended.

Prospective majors should contact the department for aid in selecting an optimum course sequence; outlines of suggested schedules are available in the department office, 362 Noyes Laboratory. Students who elect bacteriology as a major late in their college training can, in consultation with the departmental adviser, arrange a schedule to accomplish the objectives outlined above.

## COURSES FOR UNDERGRADUATES

104. **Elementary Bacteriology.** Study of bacteria, yeasts, and molds; their morphology, ecology, and principal activities. Consideration is given to the importance of microorganisms in agriculture, industry, public health, communicable diseases, and sanitation. Lecture and laboratory. I, II; 5. Prerequisite: Chemistry 101 or 102, or equivalent; sophomore standing. HALVORSON.

### COURSES FOR ADVANCED UNDERGRADUATES

207. **Research and Special Problems.** I; 3 to 5. Prerequisite: Senior standing; twenty hours of bacteriology; consent of instructor. STAFF.

208. **Research and Special Problems.** II; 3 to 5. Prerequisite: Senior standing; twenty hours of bacteriology; consent of instructor. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

300. **General Microbiology.** Emphasis is placed on the fundamental concepts and techniques of microbiology; isolation, cultivation, and observation of bacteria. The morphology, physiology, and nutrition of microorganisms; their role in nature, and in infection and immunity will be considered. I, II; 5 hours, or 1 unit. Prerequisite: A college course in general botany or zoology; chemistry through organic. BORG.

306. **Principles of Experimental Bacteriology.** A study of the experimental basis of bacterial physiology, cytochemistry, and variation; the conditions which influence metabolism, growth and death; the properties of the bacterial cell and the bacterial culture. Laboratory experiments are designed to illustrate the principles of experimentation as applied to microorganisms. I; 5 hours, or 1 unit. Prerequisite: Bacteriology 300; Chemistry 124 and 234, or equivalent. GUNSALUS, JUNI, LURIA.

308. **Food and Industrial Microbiology.** The relationship of microorganisms to food manufacture and preservation, and to industrial fermentation and processing. The laboratory will consider the properties of the bacteria, yeast, molds, and actinomyces of importance to industrial processes and methods of control. Lecture and laboratory. II; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300. CLARK, HALVORSON.

309. **Nutrition and Cultivation of Microorganisms.** Nutritional and metabolic properties of the major groups of microorganisms; a comparative study of the ecology, selective isolation, cultivation of bacteria, and microbiological assays. II; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300; chemistry through quantitative analysis and organic. CLARK.

326. **Pathogenic Bacteriology.** A study of the pathogenic bacteria; classification, morphology, cultural requirements, and reactions; toxins, diagnostic tests, methods of differentiation and recognition, and the diseases bacteria cause. Lecture and laboratory. I; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300. WALLACE.

327. **Immunology and Serology.** A survey of the field of immunology; prevention of disease, diagnosis, and preparation and use of biologicals in the treatment of disease. Lecture and laboratory. II; 5 hours, or 1 unit. Prerequisite: Bacteriology 104 or 300. WALLACE.

351. **Viruses.** The study of filtrable viruses as a branch of microbiology. Statistical, physical, and chemical properties of virus particles; analysis of host-virus interaction; origin and natural relations of viruses. II; 3 hours, or ¾ unit. Prerequisite: Bacteriology 300, or equivalent. LURIA.

## BANDS

*Professor:* M. H. HINDSLEY (Director).
*Assistant Professors:* E. D. KISINGER, A. J. MCDOWELL, H. O. SEXTON.
*Instructors:* M. C. HOWE, P. W. PRICE, L. A. STARR.
*Assistants:* D. K. MCCARTY, G. W. RIGGIN.

### COURSES FOR UNDERGRADUATES

The following courses are open to men and women students who have been accepted by examination for membership in one of the University Bands—Concert Band, First Regimental Band, Second Regimental Band. Assignments are made according to proficiency and instrumentation. New students should make appointments for auditions at the Bands Office, in person or by mail.

Completion of the courses involves, in addition to the regular schedule of rehearsals (three hours weekly), participation in the public appearances of the bands. Credit is given only as a substitute for credit in military courses required for freshmen and sophomores.

**101. Freshman Band.** I; 1. HINDSLEY, HOWE, KISINGER, MCCARTY, MCDOWELL, PRICE, RIGGIN, SEXTON, STARR.

**102. Freshman Band.** II; 1. HINDSLEY, HOWE, KISINGER, MCCARTY, MCDOWELL, PRICE, RIGGIN, SEXTON, STARR.

**103. Sophomore Band.** I; 1. HINDSLEY, HOWE, KISINGER, MCCARTY, MCDOWELL, PRICE, RIGGIN, SEXTON, STARR.

**104. Sophomore Band.** II; 1. HINDSLEY, HOWE, KISINGER, MCCARTY, MCDOWELL, PRICE, RIGGIN, SEXTON, STARR.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Junior Band.** I; no credit. HINDSLEY, KISINGER, MCDOWELL, SEXTON, STARR.

**202. Junior Band.** II; no credit. HINDSLEY, KISINGER, MCDOWELL, SEXTON, STARR.

**203. Senior Band.** I; no credit. HINDSLEY, KISINGER, MCDOWELL, SEXTON, STARR.

**204. Senior Band.** II; no credit. HINDSLEY, KISINGER, MCDOWELL, SEXTON, STARR.

## BIOLOGICAL SCIENCES

### COURSES FOR UNDERGRADUATES

**100. Biological Resources of Latin America.** A survey of plant and animal distribution and resources of Latin America and their economic significance, with emphasis upon their exploitation and vocational opportunities; human biology and public health problems in Latin America. II; 2. Credit in this course may not be applied to fulfillment of major requirements in the departments of Botany and Zoology. Prerequisite: Five hours of biological sciences, or a one-year course in high school biology and consent of instructor; sophomore standing. FULLER.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**331. Physico-Chemical Biology. Part I: Radiobiology.** Same as Botany 331 and Physiology 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit. Prerequisite: One year of biology, physics, chemistry, and mathematics.

**332. Physico-Chemical Biology. Part II: Photobiology.** Same as Botany 332. Lecture and seminar course dealing with interaction of light and living matter (photosynthesis, phototropism, vision, bioluminescence). I; 3 hours, or 1 unit. Prerequisite: One year of physics, chemistry, and biology; consent of instructor. Offered in 1953-1954 and in alternate years. RABINOWITCH.

**333. Physico-Chemical Biology. Part III: Electrobiology.** Same as Botany 333 and Physiology 333. Potentials produced by and effects of potentials upon living organisms. Lectures, reports, and demonstrations. II; 3 hours, or ¾ unit. Prerequisite: Ten

hours of biology, four hours of physical chemistry, and ten hours of physics. Offered in 1952-1953 and in alternate years. PROSSER.

354. **Biophysics Laboratory.** Same as Physics 354. Laboratory experiments in optics, electricity, and nuclear physics designed to familiarize the student with the physical apparatus and techniques useful in biophysics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. RAWCLIFFE.

## BOTANY

*Professors:* O. TIPPO (Chairman of Department), L. M. BLACK, R. EMERSON, H. J. FULLER, C. F. HOTTES (Emeritus), G. N. JONES, L. SHANOR, E. I. RABINOWITCH, K. B. RAPER (Visiting), M. M. RHOADES, A. G. VESTAL.
*Associate Professors:* J. R. LAUGHNAN, J. F. NANCE, W. N. STEWART.
*Research Associates:* A. S. HOLT, S. NISHIMURA.
*Associate:* STELLA M. HAGUE (Emerita).
*Instructor:* P. C. SILVA.
*Assistants:* W. A. BRUN, T. CAYLE, E. H. COE, JR., ELLEN DEMPSEY, MARGARET HOLTZ, MARILYN B. ELLERMANN, H. KUEHN, F. C. LANE, R. LICHTWARDT, M. LIN, E. JEANNE MORGAN, SARA R. PETERSON, HOPE S. PUNNETT, D. L. RICHARDSON, W. STERN, RHETA H. SWAIN, S. TULPULE, E. E. TYLUTKI, S. L. WILSON.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours of botany excluding Botany 100, Divison of General Studies 131, 132, and Biological Sciences 100, and including Botany 120 or 304, 130 and 160, and at least five hours in courses listed for advanced undergraduates and graduates.

**Minors:** Twenty hours in one or two departments chosen in consultation with the chairman of the department from the following list: agronomy, bacteriology, chemistry, entomology, geography, geology, horticulture, mathematics, physics, physiology, plant pathology, and zoology. At least eight hours must be taken in each department, if two are chosen.

NOTE: Students preparing to teach high school botany or biology should see Professor H. J. Fuller, adviser for teacher-training curriculum in biology, 301 Natural History Building, at the time of their registration.

### COURSES FOR UNDERGRADUATES

100. **General Botany.** The basic principles of plant structure, growth, physiology, reproduction, evolution, and distribution, with special emphasis upon the role of the plant kingdom in the cycles of nature and in human life. This course fulfills a portion of the general education requirement in biological sciences in the College of Liberal Arts and Sciences. Students must register in one lecture section, one discussion section, and one laboratory section. (This course replaces Bot. 100-101, 104, and 105). I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. FULLER (in charge), SHANOR, STEWART, TIPPO.

116. **Economic Botany.** Uses of plants and plant products by man; origin of cultivated plants and their relation to human history. II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. FULLER.

120. **Survey of the Plant Kingdom.** A study, at an elementary level, of the life histories of plants, representative of algae, fungi, mosses, ferns, and seed plants. II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. STEWART.

130. **Plant Physiology.** General consideration of the important plant functions and processes. I; 5. Prerequisite: Botany 100; one course in organic chemistry (Chemistry 132, or 133, or 234, or equivalent). NANCE.

**160. Introductory Systematic Botany (Plant Taxonomy).** Classification and identification of flowering plants, with special reference to the local flora and the needs of high school teachers. Occasional field trips required. I or II; 3. Prerequisite: Botany 100, or Division of General Studies 131 and 132. JONES.

### COURSES FOR ADVANCED UNDERGRADUATES

**226. Poisonous Plants.** The first part of the course deals with the identification of plants poisonous to animals, while the second part deals with the diagnosis, treatment, and prevention of plant poisonings. II; 2. Prerequisite: Botany 100 or equivalent; third-year standing in veterinary curriculum. JONES, LINK.

**280. Forest Ecology.** American trees and their requirements; forest sites, stands, and types. II; 3. Prerequisite: One year of botany; junior standing, or registration in pre-forestry curriculum. VESTAL.

**293. Honors Course.** I; 2. Prerequisite: Fifteen hours of botany; senior standing. STAFF.

**294. Honors Course.** II; 2. Prerequisite: Fifteen hours of botany; senior standing. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**300. Individual Topics.** For seniors and first-year graduate students who wish to study individual problems and topics not assigned in other courses. Undergraduates may not offer more than five hours in Botany 300 and 301 toward a bachelor's degree, nor graduate students more than one unit in Botany 300 and 301 toward a master's degree. I; 2 to 5 hours, or ¼ to ½ unit. Prerequisite: Botany 100; ten hours of advanced work in botany or another biological science; senior standing. STAFF.

**301. Individual Topics.** For seniors and first-year graduate students who wish to study individual problems and topics not assigned in other courses. Undergraduates may not offer more than five hours in Botany 300 and 301 toward a bachelor's degree, nor graduate students more than one unit in Botany 300 and 301 toward a master's degree. II; 2 to 5 hours, or ¼ to ½ unit. Prerequisite: Botany 100; ten hours of advanced work in botany or another biological science; senior standing. STAFF.

**304. General Plant Morphology.** A survey of the principles of plant morphology as exemplified by the various plant groups. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: Botany 100, or Division of General Studies 131 and 132; senior standing, or consent of instructor. STEWART.

**306. Biology for Teachers.** Same as Zoology 306. A teacher-training and review course for those engaged in or preparing for teaching general biology in high school. II; 2 hours, or ¼ or ½ unit. Prerequisite: Botany 100; Zoology 101. FULLER, MATTESON.

**307. Fruit Diseases.** Same as Horticulture 307 and Plant Pathology 307. Symptomatology, control measures. Laboratory and field studies of representative diseases. I; 3 hours, or ½ unit. Prerequisite: Botany 317 or 372. Offered in 1953-1954 and in alternate years. ANDERSON.

**308. Vegetable and Canning Crop Diseases.** Same as Horticulture 308 and Plant Pathology 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Botany 317 or 372. Offered in 1952-1953 and in alternate years. LINN.

**317. Plant Pathology.** Same as Agronomy 317, Horticulture 317, and Plant Pathology 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. BLACK.

**320. Cytology.** Study of nuclear and cell division with emphasis on chromosome structure and behavior. Various aspects of cytological behavior are considered in relation to genetics and development. II; 4 hours, or 1 unit. Prerequisite: One year of botany including Botany 340; senior standing. RHOADES.

**322. Genetics.** A basic treatment of the facts and fundamental principles of genetics, with special emphasis on plants. I; 4 hours, or 1 unit. Prerequisite: One year of botany; senior standing. LAUGHNAN.

**325. Paleobotany.** Same as Geology 325. The structure, phylogeny, and geological distribution of representative fossil plants. Two or three field trips. II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 100, or Division of General Studies 131 and 132; Geology 101, or consent of instructor. Offered in 1952-1953 and in alternate years. STEWART.

**331. Physico-Chemical Biology. Part I: Radiobiology.** Same as Biological Sciences 331 and Physiology 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit. Prerequisite: One year of biology, physics, chemistry, and mathematics.

**332. Physico-Chemical Biology. Part II: Photobiology.** Same as Biological Sciences 332. Lecture and seminar course dealing with interaction of light and living matter (photosynthesis, phototropism, vision, bioluminescence). I; 3 hours, or 1 unit. Prerequisite: One year of physics, chemistry, and biology; consent of instructor. Offered in 1953-1954 and in alternate years. RABINOWITCH.

**333. Physico-Chemical Biology. Part III: Electrobiology.** Same as Biological Sciences 333 and Physiology 333. Potentials produced by and effects of potentials upon living organisms. Lectures, student reports, and demonstrations. II; 3 hours, or ¾ unit. Prerequisite: Ten hours of biology, four hours of physical chemistry, and ten hours of physics. Offered in 1952-1953 and in alternate years. PROSSER.

**335. Plant Physiology: Metabolic Transformations.** II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: One year of botany including Botany 130; one year of chemistry. HOLT, NANCE.

**340. Histological Technic.** Survey of technics used in the preparation of plant tissues for microscopical examination. II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: One year of botany, or ten hours of zoology. TIPPO.

**344. Spermatophytes.** Morphology of seed plants. II; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany including Botany 304; senior standing. Offered in 1953-1954 and in alternate years.

**345. Plant Anatomy.** Study of the internal structure of vascular plants with special emphasis on function and evolutionary history. I; 3 to 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. TIPPO.

**360. Advanced Systematic Botany.** Phylogenetic study of flowering plants; relationship of the principal orders and families; problems of nomenclature; identification of specimens. I; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 160. Offered in 1953-1954 and in alternate years. JONES.

**366. Field Botany.** Identification and classification of native and naturalized flowering plants of eastern North America. S; 3 or 5 hours, or ½ or 1 unit. Prerequisite: One course in botany; consent of instructor. JONES.

**372. General Mycology.** Structure, classification, and identification of fungi, including those of economic importance. II; 4 hours, or 1 unit. Prerequisite: One year of botany, bacteriology, entomology, or zoology; senior standing, or consent of instructor. SHANOR.

**377. Diseases of Field Crops.** Same as Agronomy 377 and Plant Pathology 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Botany 317 or Agronomy 121, or consent of instructor. BEVER, GERDEMANN.

**379. Research Methods in Plant Pathology.** Same as Agronomy 379, Horticulture 379,

and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Botany 317; senior standing. GOTTLIEB, GERDEMANN.

**381. Plant Ecology.** Principles of ecology, exemplified by vegetation and environments of Illinois. I; 3 hours, or ½ unit. Prerequisite: One year of botany. VESTAL.

**385. Plant Geography of North America.** Vegetation regions and principal subdivisions; environments, plant cover, floras. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. Offered in 1953-1954 and in alternate years. VESTAL.

**386. Plant Geography of Continents Other Than North America.** Regions, vegetation-types, notable species. I; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany. Offered in 1952-1953 and in alternate years. VESTAL.

**388. Ecology: Plant Communities.** Characteristics, types, development, and classification of communities. II; 3 or 5 hours, or ½ to 1 unit. Prerequisite: One year of botany, including Botany 280 or 381. Offered in 1953-1954 and in alternate years. VESTAL.

## BUSINESS ORGANIZATION AND OPERATION

**(Including Accountancy, Business Law, Management, Marketing, and Secretarial Training)**

*Professors:* H. T. SCOVILL (Head of Department), A. G. ANDERSON, H. H. BAILY, F. H. BEACH, L. A. BRYAN, P. D. CONVERSE, R. I. DICKEY, E. R. DILLAVOU, E. J. FILBEY (Emeritus), C. J. GAA, P. M. GREEN, H. W. HUEGY, F. M. JONES, A. C. LITTLETON, M. J. MANDEVILLE, L. MOREY, C. A. MOYER, H. L. NEWCOMER, F. A. RUSSELL (Emeritus), C. H. SANDAGE, C. F. SCHLATTER, E. L. THEISS (Emeritus).

*Associate Professors:* A. C. CONDON, C. C. CURTIS, R. DUBIN, R. K. MAUTZ, P. C. ROBERTS, S. C. ROBINSON, H. G. WALES, N. WEDDING.

*Assistant Professors:* H. E. BREEN, J. M. CARRITHERS, C. C. DELONG, H. M. EDWARDS, MABEL R. HAGAN, DOROTHY LITHERLAND, ELIZABETH MELSON, R. V. MITCHELL, W. E. THOMAS, N. D. WAKEFIELD.

*Lecturer:* I. A. COCHRUN.

*Instructors:* G. D. BRIGHTON, M. N. BROUSSARD, R. H. COLE, C. M. CRAWFORD, H. L. CROUSE, D. J. HAY, D. A. HENNING, ALICE C. KIRKPATRICK, C. LAWRENCE, R. E. LUNDQUIST, G. E. MARTIN, W. O. MORRIS, MILDRED E. REED, M. D. RICHARDS, F. L. ROBERTS, D. W. SCOTTON, C. SPIVEY, W. A. TERREL.

*Assistants:* B. F. ASCHBACHER, MARY ASHBY, B. L. BARNES, F. M. BASS, L. M. DEBOER, L. E. HAY, D. J. JAMES, M. K. KELLOGG, A. F. KNAPPER, P. P. LEBRETON, E. W. LUDWIG, K. W. PERRY, R. E. SCHLOSSER, D. H. SKADDEN, A. W. WYATT, V. K. ZIMMERMAN.

Courses offered in the Department of Business Organization and Operation deal with the problems encountered from day to day in the several departments of a private business (including the organization thereof); and in the business departments of public or quasi-public institutions. They deal with accountancy in all of its phases; organization; marketing in its several phases; management; business law; and secretarial training.

A student in the College of Commerce and Business Administration does not select a major or a minor in these subjects, but he takes the courses as outlined in the several curricula of the College. Each curriculum or field of concentration is so constituted as to offer the student a good general knowledge of business and economics as well as a more intensive preparation in the field in which he is most interested.

Any of the courses listed below may be taken by students from other branches or departments of the University who meet the prerequisites.

## Accountancy

### COURSES FOR UNDERGRADUATES

**101. Principles of Accounting.** Simple transactions, general ledger accounts, books of original entry, closing process, trial balances, financial statements, accounting for negotiable instruments, controlling accounts, adjusting entries. Students who present one unit of bookkeeping for entrance will not be allowed credit for Accountancy 101, and should register in Accountancy 102. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. CARRITHERS, WAKEFIELD, and others.

**102. Principles of Accounting.** Similar to Accountancy 101. For those who present one unit of entrance credit in bookkeeping. Students who have failed Accountancy 101 are permitted to register in Accountancy 102 and receive credit as in Accountancy 101 if their final grade is "C" or above. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. BREEN and others.

**105. Accounting Procedure.** Relation of business documents to the accounts; fundamentals of partnership and corporation accounting; business forms and records; financial statement analysis. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Accountancy 101 or 102. CARRITHERS, WAKEFIELD, and others.

**106. Elementary Cost Accounting.** Accounting for production management. Principles and methods of accounting for managerial control of costs of production. I, II; 3. Prerequisite: One year of accountancy; sophomore standing; credit or registration in Economics 102 or 108. DICKEY, SCHLATTER, THOMAS, and others.

**108. Intermediate Accounting.** Consideration at the intermediate level of accounts and transactions peculiar to the partnership and corporation types of organization and of modern basic concepts of accounting theory; interpretation of financial statements and analysis of the principal accounts represented therein. I, II; 3. Prerequisite: Sophomore standing; Accountancy 105. LAWRENCE, LITHERLAND, MAUTZ, and others.

**121. Business Computations.** Primarily for students registered in the commercial teaching curriculum. Fundamental processes, annuities, bond valuations, installment sales, mark-ups and mark-downs, application of logarithms, metric system, simple algebraic and trigonometric computations. I, II; 3. L. E. HAY.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Fundamentals of Accounting.** A survey course in the principles of accounting for students registered in schools and colleges other than Commerce. Subjects covered are similar to those listed under Accountancy 101 and 105. This course or its equivalent is required of students in the four-year law curriculum. I, II; 3. BROUSSARD, DICKEY, and others.

**221. Current Accounting Topics.** Consideration of authoritative pronouncements dealing with controversial problems of accounting practice. II; 2. Prerequisite: Accountancy 308; senior standing. MAUTZ.

**265. Hotel Accounting.** Accounting for food preparation and service in hotels and restaurants; food inventories, food and beverage control. I; 3. Prerequisite: Accountancy 201, or 101 and 105. ZIMMERMAN.

**274. Federal Income Tax Accounting.** Basic discussion of history, theory, and broad outlines of federal income taxation, together with the more important problems of a less advanced and difficult nature. I, II; 3. Prerequisite: Accountancy 108. BRIGHTON, GAA, and others.

**291. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in accountancy. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of accountancy. I; 2 to 4. SCHLATTER and others.

**292. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in accountancy. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of accountancy. II; 2 to 4. SCHLATTER and others.

**295. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. SCHLATTER and others.

**296. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. II; 3 to 5. SCHLATTER and others.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**308. Advanced Accounting.** Reserves, sinking funds, actuarial methods, investments, partnerships, statements for special purposes, receiverships, consolidated balance sheets, foreign exchange. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 106 and 108; an average of "C" or better in preceding courses in accountancy. BREEN, LITHERLAND, NEWCOMER, and others.

**324. Accounting Systems.** A discussion of the systems used by contractors, department stores, finance companies, building and loan associations, banks, insurance companies, brokers, water companies. I, II; 2 hours, or ½ unit. Prerequisite: Accountancy 106 and 108. BAILY.

**341. Governmental Accounting.** Accounts of institutions, municipalities, and of state and federal governments; organization; procedure, budget, accounts and records, reports, audits. I, II; 2 hours, or ½ unit. Prerequisite: Accountancy 108. LUNDQUIST.

**362. Business Budgets and Accounting Control.** Procedures used in the preparation of business budgets and the principles underlying these procedures. A complete budget is prepared by the student for a typical manufacturing company. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 108 (Accountancy 106 for students majoring in industrial administration). THOMAS.

**366. Advanced Cost Accounting.** Advanced accounting for production management; principles and methods of accounting for managerial control of costs of production through the use of standards. I, II; 2 hours, or ½ unit. Prerequisite: Minimum of nine hours of accountancy including Accountancy 106. DICKEY, SCHLATTER.

**371. Auditing.** Ethics of the accounting profession; auditing standards and procedures; programs of audit of various accounts; construction and indexing of working papers; reports to clients. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 308. BREEN, MAUTZ.

**372. Auditing Problems and Cases.** Application of auditing principles in verification of financial statements; preparation of reports; case studies applicable to specific industries; current trends. I, II; 3 hours, or ½ unit. Prerequisite: Accountancy 371. MOYER, WAKEFIELD.

**374. Advanced Income Tax Problems.** Practical and theoretical training in the more common and important provisions of the federal income tax, advanced problems, tax case research and preparation. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Accountancy 274 and 308. GAA.

**377. Advanced Problems.** Consolidated statements, foreign subsidiaries, insurance, estates, theory, general statements. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Credit or registration in Accountancy 371; senior standing. CARRITHERS, NEWCOMER, WAKEFIELD.

378. **C.P.A. Problems.** Selected problems from C.P.A. examinations; analysis and revision of statements, partnerships, corporations, quasi-reorganizations, mergers, and others; theory, auditing, ethics. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Accountancy 377. BREEN, CARRITHERS, NEWCOMER, SCOVILL, WAKEFIELD.

## Business Law

### COURSES FOR UNDERGRADUATES

100. **Basic Principles of Business Law.** Basic principles in business law covering the subjects of contracts, sales, negotiable instruments, and agency. Credit toward graduation will not be given for Business Law 201 or 261 in addition to Business Law 100. I, II; 3. See Business Law 202 for provisional reduced credit. Prerequisite: Accountancy 105; Economics 102; forty-five credit hours. DILLAVOU, KIRKPATRICK.

### COURSES FOR ADVANCED UNDERGRADUATES

201. **General Principles of Business Law.** Principles of business law, covering the fields of contracts, agency, and personal property, including sales. I, II; 3. Prerequisite: Accounting 105; Economics 103. CURTIS, DILLAVOU, MORRIS, and others.

202. **General Principles of Business Law.** Principles of business law, covering negotiable instruments, partnerships, and corporations. I, II; 2 or 3. Prerequisite: Business Law 201. Business Law 100 is accepted as prerequisite but in such cases Business Law 202 carries only 2 hours credit. CURTIS, KIRKPATRICK, MORRIS, P. C. ROBERTS, and others.

261. **Summary of Business Law.** Principles of business law, including contracts, agency, sales, negotiable instruments, and business organizations. For non-commerce students. I, II; 3. CURTIS, KIRKPATRICK, and others.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **The Law of Security Transactions and Banking.** Significant phases of law in the fields of pledges, chattel mortgages, conditional sales, suretyship, insurance, real property, banks and banking, and bankruptcy. Under real property, real estate mortgages, landlord and tenant and mechanics liens are considered as well as the general principles of real property. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Credit or registration in Business Law 202; senior standing. DILLAVOU.

302. **Wills, Estates, and Trusts.** A study of the basic legal and management principles and practices involved in the planning and administration of wills, estates, and trusts. I; 3 hours, or ½ to 1 unit. Prerequisite: Business Law 201 and 202. P. C. ROBERTS.

## Management

### COURSES FOR UNDERGRADUATES

101. **Industrial Organization and Management.** Organization plans, administrative policies, and management problems with special attention to manufacturing units. I, II; 3. Students will not be given credit toward graduation for both Management 101 and Mechanical Engineering 281. Prerequisite: Economics 102, or consent of instructor; forty-five credit hours. ANDERSON, HENNING, RICHARDS, SPIVEY, and others.

### COURSES FOR ADVANCED UNDERGRADUATES

204. **Industrial Purchasing.** Organization and operation of the purchasing department, basic materials, substitutes, imitations, sources of supply, catalogs, terms, discounts, relation to salesmen. I, II; 3. Prerequisite: Management 101; Marketing 101; senior standing. SPIVEY.

**205. Production Planning and Control.** The development of methods and systems for the control and flow of work through manufacturing operations. I, II; 3. Prerequisite: Management 101. CROUSE.

**221. Work Simplification and Time Study.** Principles and methods of determining job times by motion analysis and time studies. I, II; 3. Students will not be given credit toward graduation for both Management 221 and Mechanical Engineering 232. Prerequisite: Management 101. CROUSE.

**245. Office Management.** An introductory course in the techniques of office management. It deals with the organization element, the human element, the physical element, the operation element, and the control element. I, II; 3. Prerequisite: Accountancy 105; Economics 103.

**246. Office Equipment.** The functions, applications, and limitations of various fundamental types of office equipment as related to modern business management. I, II; 2. Prerequisite: Senior standing. MELSON and others.

**252. Airline Management.** Problems arising in the management of airlines, station organization, scheduling, purchasing, air express, air mail, advertising, interline traffic. I, II; 3. Prerequisite: Economics 102 or 103, or 108. THOMAS.

**291. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in management. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of management. I; 2 to 4. MANDEVILLE.

**292. Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in management. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of management. II; 2 to 4. MANDEVILLE, SPIVEY.

**295. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. MANDEVILLE.

**296. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen hours if divided between this and any other department. II; 3 to 5. MANDEVILLE, SPIVEY.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Management in Manufacturing.** Internal problems of production and efficient control in factories. I, II; 3 hours, or ½ unit. Prerequisite: Management 101. RICHARDS.

**311. Administrative Policies and Organization.** Development of administrative organizations and the determination of policies for the integration of major activities of a business enterprise. I, II; 3 hours, or ½ unit. Prerequisite: Management 101; Marketing 101; senior standing. MANDEVILLE.

**312. Problems of Administration and Organization.** Same as Labor and Industrial Relations 312. Problems of the individual and groups brought about by modern industrial organizations and techniques. Motivations for work and cooperation between executives and different economic and social groups. I, II; 3 hours, or ½ unit. Prerequisite: Management 101, or equivalent. DUBIN, MANDEVILLE.

**340. Jurisprudence, Business Methods, and Ethics.** Same as V.C.M. 340. Principles of law, business procedures, and professional ethics of importance to members of the veterinary profession; animal disease and related regulatory laws and their administration; federal procedure under animal disease and food and meat inspection laws.

II; 3. Prerequisite: Senior standing in the veterinary curriculum. HANNAH, CARRITHERS, WOODS.

362. **Job Wage and Contract Administration.** An advanced, specialized treatment of the techniques, methods, and problems current in the wage and salary field. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Any one of the following courses or their equivalent: Economics 240, 248, Psychology 145, 290. HENNING.

## Marketing

### COURSES FOR UNDERGRADUATES

101. **Principles of Marketing.** The functions, commodities, and middlemen involved in the marketing of goods and services; the policies and problems involved in the operation of market institutions. I, II; 3. Prerequisite: Economics 102 or 108; forty-five credit hours. HUEGY, MARTIN, MITCHELL, F. L. ROBERTS, and others.

### COURSES FOR ADVANCED UNDERGRADUATES

211. **Principles of Retailing.** The fundamentals of buying, sales promotion, pricing, control, and store finance. I, II; 3. Prerequisite: Marketing 101. COLE, JONES, and others.

212. **Retail Sales Promotion.** The methods of determining where and what to promote, the guideposts in selecting merchandise for promotion, the budgeting and planning of sales promotion activities, the carrying out of the plan, external and internal methods of promotion business, the coordination of sales promotion activities. II; 2. Prerequisite: Marketing 211. D. J. HAY.

271. **Salesmanship.** Brief historical review of selling; fundamentals and technic of salesmanship today. I, II; 2. Credit is not given in both Marketing 271 and 272. Prerequisite: Marketing 101. BEACH, D. J. HAY, ROBINSON, WALES.

272. **Industrial Selling.** A survey course in marketing and salemanship for non-commerce students interested in selling industrial products. I, II; 3. Students may not receive credit for both Marketing 271 and 272 or Marketing 101 and 272. HAY.

281. **Introduction to Advertising.** Same as Journalism 281. A survey of the economics, psychology, and philosophy of advertising; preparation of advertisements; selection of media and organizational structure. I, II; 3. Prerequisite: Credit or registration in Marketing 101. COLE, CRAWFORD, FRYBURGER, MCCLURE.

282. **Advertising Procedures.** Same as Journalism 282. This course is designed to give students who do not wish to major in advertising an opportunity to become familiar with the basic elements of typography, copy, and layout. Students will not be given credit toward graduation for both Marketing 282 and 382. I, II; 3. Prerequisite: Marketing 281 or Journalism 281. WALES.

283. **Current Advertising Developments.** Same as Journalism 283. An analysis of problems, practices, and prospects in the field of advertising as viewed by current practitioners and writers. I, II; 1. Prerequisite: Senior standing and major in advertising or consent of instructor. SANDAGE.

288. **Sales Writing.** Same as Journalism 288 and Rhetoric 271. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151, or consent of instructor. MAGUIRE, SARGENT, TUCKER.

291. **Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in marketing. Option B—a comprehensive examination, six hours in length, covering a review of various aspects of marketing. I; 2 to 4. JONES and others.

292. **Honors Course.** Senior candidates for graduation with high honors should elect one or the other of the following options: Option A—an acceptable thesis in marketing.

Option B—a comprehensive examination, six hours in length, covering a review of various aspects of marketing. II; 2 to 4. JONES and others.

**295. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. JONES and others.

**296. Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. II; 3 to 5. JONES and others.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**305. Contemporary Problems in Marketing Management.** The problems which marketing managers are currently facing and an analysis of the policy decisions they must make to operate effectively. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101; senior standing. MITCHELL.

**315. Retail Buying.** Principles and procedures in buying for resale. Organization for buying, analysis of customer demand, model stock plans, sources of supply, resident buying, cooperative and central buying, foreign buying, selection of merchandise, and trade relations. I, II; 2 hours, or ½ unit. Prerequisite: Marketing 211. JONES.

**321. Marketing Research and Policies.** The basic techniques used in business research and specific research projects, and how their findings are used in the formulation of marketing policies. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101. CRAWFORD, MARTIN.

**323. Problems in Business Research.** Selected problems in the field of commercial research. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Marketing 321. MARTIN.

**325. Sales and Distribution Cost Analysis.** Basic techniques and principles of sales and distribution cost analysis for management control of marketing activities. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101 and senior standing for commerce students, or consent of instructor. MITCHELL.

**331. Grain Grading and Marketing.** Same as Agronomy 331 and Agricultural Economics 331. Factors affecting the quality of grain crops; standards employed in their classification and grading in the commercial market; laboratory practice in grain grading; a trip to a commercial grain grading laboratory; economic problems and market operations in grain marketing. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230 and Agronomy 121, or consent of instructor. DUNGAN, NORTON.

**332. Livestock Marketing.** Same as Agricultural Economics 332. Problems and practices in marketing livestock. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or consent of instructor. W. J. WILLS.

**333. Marketing Horticultural Products.** Same as Agricultural Economics 333 and Horticulture 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or five hours of horticulture. KELLY.

**334. Marketing Dairy Products.** Same as Agricultural Economics 334 and Dairy Science 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor

unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

345. **Credits and Collections.** Retail and mercantile credit and collection principles and practices. I, II; 3 hours, or ½ unit. Prerequisite: Marketing 101. HUEGY and others.

349. **Trade Associations and Commercial Organizations.** Principles of trade association and Chamber of Commerce organization and management. II; 2 hours, or ½ unit. Prerequisite: Marketing 101; Business Law 201; senior standing. WEDDING.

372. **Advanced Salesmanship.** An application of sales techniques to actual selling situations. Students make sales presentations, and critical appraisals are given. I, II; 2 hours, or ¼ unit. Prerequisite: Marketing 271. D. J. HAY, WALES.

373. **Sales Management.** Modern sales organization; selling problems of manufacturers, wholesalers, and retailers; management of salesmen. I, II; 2 hours, or ½ unit. Prerequisite: Marketing 271. BEACH.

382. **Advertising Copy and Layout.** Same as Journalism 382. Theory and practice of advertising copy writing and layout for newspaper, magazine, and direct mail. Advertising planning for the local advertiser. Use of consumer and market surveys, copy-testing methods, and advertising readership studies. I, II; 4 hours, or 1 unit. Students will not be given credit toward graduation for both Marketing 382 and 282. Prerequisite: Marketing 281 or Journalism 281; Journalism 204. MILLICAN and others.

383. **Advertising Media.** Same as Journalism 383. Analysis of the various advertising media in terms of markets served and factors to consider in the selection of media. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281 or Marketing 281. FRYBURGER.

384. **Advertising Campaigns.** Same as Journalism 384. Planning and execution of an advertising campaign; market and consumer research; development and allocation of advertising budget; organization and functions of advertising agency; choice of advertising appeals; selection of media; preparation of advertisements—copy and layout. I, II; 3 hours, or ½ unit. Graduate students may not receive credit for both Marketing 384 and 387. Prerequisite: Marketing 382 or 282, and 383. WEDDING.

385. **Advertising Promotion and Sales.** Same as Journalism 385. Sales problems, advertising promotion, advertising research, market research. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Marketing 281 or Journalism 281. MCCLURE.

386. **Radio and Television Advertising.** Same as Journalism 386. Economics, standards, and ethics as applied to radio and television commercials; sponsorship, rates, and advertising techniques, including merchandising, marketing, servicing, and sales. preparation and presentation of radio advertising copy, measurements, and listener surveys. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281 or Marketing 281. SANDAGE.

387. **Advertising Policies and Problems.** Same as Journalism 387. Analysis of actual advertising situations and study of how such situations were or might have been met. Consideration given to management and technical problems at both the national and retail levels. I, II; 3 hours, or ½ to 1 unit. Graduate students may not receive credit for both Marketing 384 and 387. Prerequisite: Journalism 281 or Marketing 281. WEDDING.

## Secretarial Training

### COURSES FOR UNDERGRADUATES

101. **Beginning Typewriting.** A beginning course in typewriting. Credit toward graduation is granted only to those in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I, II; 2. LUDWIG.

**102. Intermediate Typewriting.** An intermediate course in typewriting for prospective teachers of that subject. Credit toward graduation is granted only to those registered in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I or II; 2. Prerequisite: Secretarial Training 101, or passing of proficiency examination. LUDWIG.

**103. Advanced Typewriting.** An advanced course in typewriting for prospective teachers of that subject. Credit toward graduation is granted only to those registered in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I or II; 2. Prerequisite: Secretarial Training 102, or passing of proficiency examination. REED.

**111. Beginning Shorthand.** A beginning course in Gregg shorthand. Credit toward graduation is granted only to those registered in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I or II; 3. CONDON, HAGAN, KNAPPER.

**112. Intermediate Shorthand.** An intermediate course in Gregg shorthand for prospective teachers of that subject. Credit toward graduation is granted only to those registered in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I or II; 3. Prerequisite: Secretarial Training 111, or passing of proficiency examination. CONDON, KNAPPER, REED.

**113. Advanced Shorthand.** An advanced course in Gregg shorthand for prospective teachers of that subject. Credit toward graduation is granted only to those registered in the curriculum in secretarial training or as majors or minors in the curricula in teacher training. No others are admitted to the course. I or II; 3. Prerequisite: Secretarial Training 112, or passing of proficiency examination. CONDON, REED.

### COURSES FOR ADVANCED UNDERGRADUATES

**222. Advanced Dictation and Reporting.** This course aims to develop an ability to take dictation at high rates of speed (140 words per minute and above) and to apply this ability to the taking of dictated material in a variety of types of reporting activities. II; 3. Prerequisite: Secretarial Training 113. CONDON, KNAPPER.

**224. Survey of Shorthand for Teachers.** A demonstration and skill-building course designed to improve all phases of shorthand knowledge, with special emphasis on an integrated presentation of the theory principles of Gregg Shorthand Simplified, transcription training, and speed building. S; 3. Prerequisite: Six hours credit in shorthand or equivalent. Graduate credit is limited to those students registered in the programs leading to the degree of Master of Education and the Advanced Certificate in Education. CONDON.

**233. Executive Secretarial Practice.** This course presents some of the practical problems a secretary may encounter. Through practical discussion of work situations, it aims to broaden the point of view of the student and to aid him in developing efficient office work habits. II; 2. Prerequisite: Secretarial Training 113. MELSON.

**241. Records Management.** This course aims to assist those preparing for a career in business in recognizing the need for a records department with sufficient authority and control to make the functions of filing and record keeping distinct in the organizational structure. II; 2. KNAPPER.

**261. Office Equipment (for Teachers).** Designed to teach the operation of office equipment and to help in the planning of courses in the subject, with some emphasis on the operation techniques. Also included will be such topics as organization of an office machines course, selection of minimum and maximum equipment and its cost, how to recognize community needs for specific equipment, the care to be given machines, the service needed, teaching aids available, and the production standards students need for threshold jobs. S; 4. Prerequisite: Senior standing. Graduate credit is limited to those students registered in the programs leading to the degree of Master of Education and the Advanced Certificate in Education. MELSON.

# CERAMIC ENGINEERING

*Professors:* A. I. Andrews (Head of Department), R. L. Cook, R. K. Hursh, F. V. Tooley.
*Associate Professor:* A. W. Allen.
*Assistant Professor:* E. D. Lynch.
*Assistant:* R. J. Beals.

### COURSES FOR UNDERGRADUATES

**101. Introduction to Ceramic Engineering.** Raw materials, classification and characteristics of ceramic products, and methods of manufacture. Recitations and laboratory. I; 3. Prerequisite: Sophomore standing in ceramic engineering. Allen, Lynch.

**102. Ceramic Processes and Equipment.** Sources, preparation of materials, and manufacturing processes and control. Recitations and field trip. II; 3. Prerequisite: Sophomore standing in ceramic engineering. Beals.

**123. Pottery and Ceramic Glazes.** A general introduction to the techniques of formulating, forming, and firing ceramic pottery, particularly for non-engineering students. Recitation and laboratory. I, II; 2. Lynch.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Ceramic Technology.** Crystal chemistry and phase equilibria as applied to ceramic materials; properties of raw materials. Recitations and laboratories. I; 5. Prerequisite: Junior standing in ceramic engineering. Cook, Lynch.

**202. Ceramic Technology.** Continuation of Ceramic Engineering 201; properties of fired ceramic materials and compositions. Recitations and laboratories. II; 5. Prerequisite: Ceramic Engineering 201. Cook, Lynch.

**203. Principles of Drying.** Drying, drying equipment, and construction and regulation of dryers. Recitations. I; 3. Prerequisite: Credit or registration in Ceramic Engineering 201. Hursh.

**204. Kilns, Furnaces, and Firing Operations.** The firing process, utilization of fuels, types of kilns and furnaces and their operation. Recitations. II; 3. Prerequisite: Credit or registration in Ceramic Engineering 202. Hursh.

**211. Ceramic Bodies and Glazes.** Materials, compositions, processing, properties, and tests. Recitations and laboratories. I; 5. Prerequisite: Ceramic Engineering 202. Beals, Cook, Lynch.

**214. Elementary Glass Technology.** Elementary consideration of the general constitution of glass, unit processes and operations in the preparation of glass, and data on the glass industry. Preparation of glasses of various compositions, and measurement of important glass properties. Lectures and laboratory. II; 3. Prerequisite: Junior standing in ceramic engineering, chemistry, or physics. Tooley.

**216. Porcelain Enamels.** Compositions, preparation, application, properties, and tests. Recitations. II; 3. Prerequisite: Registration in Ceramic Engineering 202. Cook.

**217. Elementary Glass Technology.** Continuation of Ceramic Engineering 214. This course completes the study of unit processes and operations in the glass preparation process and introduces the student to the study of glass properties of importance in manufacture and end use. I; 2. Prerequisite: Ceramic Engineering 214. Tooley.

**218. Refractories.** Composition and properties of refractory materials and products, their manufacture and use. Recitations. II; 3. Prerequisite: Ceramic Engineering 202 and 204. Allen.

**221. Pyrometry.** Principles and methods used in high temperature measurement and in process temperature control. Recitation and laboratory. I, II; 2. Prerequisite: Junior standing; sophomore physics. Allen, Beals.

**33. Methods of Ceramic Microscopy.** Microscopic, photographic, and related optical methods of measurement applied to interpretation of pyrochemical reactions and control of raw materials and products of ceramic engineering. I, II; 3. Prerequisite: Geology 130; sophomore physics. ALLEN.

**56. Porcelain Enamel Laboratory.** Smelting milling application properties and tests. Laboratories. II; 2. Prerequisite: Credit or registration in Ceramic Engineering 216. BEALS, COOK.

**71. Ceramic Engineering Design.** Design of ceramic dryers, kilns, and furnaces. Laboratories. I; 2. Prerequisite: Theoretical and Applied Mechanics 221; Ceramic Engineering 203 and 204. HURSH.

**72. Ceramic Engineering Design.** Design of special ceramic equipment, factory planning, and layout. Laboratories. II; 3. Prerequisite: Theoretical and Applied Mechanics 221; Ceramic Engineering 203, 204, and 271. HURSH.

**95. Research Methods.** Procedures and planning of investigations in ceramic research. I, II; 1. Prerequisite: Senior standing in ceramic engineering. TOOLEY.

**97. Thesis.** Research investigation in ceramics or ceramic engineering. I; 2. Prerequisite: Senior standing; credit or registration in Ceramic Engineering 295. ALLEN, ANDREWS, COOK, HURSH, LYNCH, TOOLEY.

**98. Thesis.** Research investigation in ceramics or ceramic engineering. II; 1 to 3. Prerequisite: Senior standing. ALLEN, ANDREWS, COOK, HURSH, LYNCH, TOOLEY.

**99. Inspection Trip.** Visits to industrial plants. I; no credit. Prerequisite: Senior standing. ALLEN, BEALS, COOK.

## CHEMISTRY

**(Including Chemical Engineering)**

*Professors:* R. ADAMS (Head of Department), L. F. AUDRIETH, J. C. BAILAR, JR., A. M. BUSWELL, H. E. CARTER, G. L. CLARK, D. T. ENGLIS, R. C. FUSON, B. S. HOPKINS (Emeritus), H. F. JOHNSTONE, H. A. LAITINEN, C. S. MARVEL, T. E. PHIPPS, W. H. RODEBUSH, W. C. ROSE, G. F. SMITH, H. R. SNYDER, F. G. STRAUB, S. SWANN, JR., F. T. WALL.

*Associate Professors:* H. G. DRICKAMER, R. B. DUFFIELD, N. J. LEONARD, G. T. MOELLER, C. S. VESTLING.

*Assistant Professors:* VIRGINIA BARTOW, D. Y. CURTIN, R. K. FINN, H. S. GUTOWSKY, L. M. HENDERSON, R. A. JOHNSON, R. F. NYSTROM, M. PETERS, W. E. RANZ, B. R. RAY, M. TAMRES, J. W. WESTWATER, P. E. YANKWICH.

*Associates:* ROSALIE M. PARR (Emerita).

*Instructors:* E. P. BERTIN, E. J. COREY, L. F. GOODYEAR, H. V. MALMSTADT, E. C. TAYLOR.

*Assistants:* V. D. AFTANDILIAN, L. B. ANDERSON, R. E. ANDERSON, E. F. APPLE, J. J. BEER, A. BERESNIEWICZ, H. BIRCH, S. J. BODNAR, D. E. BRASURE, V. E. BUHRKE, B. B. BURNETT, P. L. COOK, W. E. COOLEY, W. R. CORNMAN, D. D. DARSOW, R. L. DEHM, E. E. DEKKER, L. F. DEMPSEY, J. R. DEMUTH, C. T. ELSTON, F. V. FAIR, E. R. FETT, R. L. FISCHER, M. J. FLETCHER, H. M. FOSTER, W. F. FRIEDLANDER, S. J. GILL, A. W. HELWIG, Y. G. HENDRICKSON, ROSEMARY HILL, R. W. HILL, E. T. HOUVOURAS, H. W. JOHNSON, JR., R. L. JOHNSON, N. W. KALENDA, C. W. KAMMEYER, R. O. KERR, M. L. KILLEY, T. J. KNEIP, H. E. KNIPMEYER, RUTH KOSKI, L. I. KRIMEN, S. D. LARSON, R. J. LOKKEN, E. R. LOVEJOY, F. MCCOLLOUGH, V. P. MILO, T. R. MOORE, JR., J. D. O'ROURKE, R. E. POST, A. L. PROMISLOW, R. E. PUTNAM, ELLA RICHARDS, W. G. ROBINSON, JR., A. M. ROSS, J. H. SINFELT, W. E. SMITH, A. A. SMUCKER, M. K. SNYDER, E. C. STEINER, E. J. STROJNY, R. F. SYMPSON, H. C. TERFORD, W. E. THATCHER, C. R. THOMAS, M. TUNIS, J. F. WALKER, R. C. WENDT, D. H. WILKINS, J. K. WILLIAMS, R. E. WILSON, R. L. WIXOM, D. E. WOERNER, D. W. WOOD, O. YORK, JR.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in chemistry, excluding Chemistry 101, 102, 103, 104, 105, 106, 107, 108, and including courses in qualitative, quantitative, and organic chemistry. At least five hours must be taken from courses in the 300 group.

**Minors:** Twenty hours chosen from not more than two of the following: bacteriology, botany, ceramic engineering, entomology, geology, mathematics, philosophy, physics, physiology, psychology, and zoology. At least eight hours must be taken in each subject if two are chosen.

**Honors:** Students registered in Chemistry 290 or Chemical Engineering 290 automatically become candidates for honors. All other students in the chemistry or chemical engineering curriculum or majors in chemistry who have a 4.0 average or better are eligible to become candidates for honors, provided they signify their intentions in writing to their adviser, preferably at the time of registration in the first semester of their senior year, but not later than at the time of registration for the second semester. This declaration of intention by the student shall be accompanied by registration in certain specific courses. Students in chemical engineering should select Chemical Engineering 381 or 379. Others should make a selection from one of the courses in the 300 group which will be indicated by the adviser as having been approved for this purpose by the department. The candidates will be required to supplement the regular work of the course with special assignments by the instructor. The final recommendation for honors will be based chiefly upon the previous record and the performance in the selected course.

### SEQUENCE OF COURSES

Students in the curriculum of chemistry, majors in chemistry, and all others who desire a thorough training in the fundamentals of chemistry and their applications to modern life should select courses from the following, usually in the sequence given: Chemistry 101 or 102, 106, 110, 124, 234, 336, 337, 240, 241, 342, 343, 350, and courses in the chemical engineering and miscellaneous groups. Students in the curricula of chemistry and chemical engineering who have had a thorough training in preparatory chemistry may be able to shorten the time spent in the foundational courses by taking the sequence: Chemistry 107, 108, 124, 234, 336, 337, 240, 241, 342, and other advanced courses. Students in the College of Engineering (except ceramists, ceramic engineers, and those who desire to take Chemistry 240) should register in Chemistry 103 or 102, 104, 122.

Students who are compelled to meet chemical requirements briefly may register for the following sequence: Chemistry 101 or 102, 105, 122, 132 or 133. Students who find it impossible to take more than one semester's work are requested to register in Chemistry 101 or 102 in the second semester rather than in the first.

### RESTRICTIONS

Students of junior standing must have a 3.5 general average, exclusive of the basic courses in military training and the required work in physical education and hygiene, in order to register in the curriculum of chemistry or chemical engineering. With the exception of students in the College of Engineering and the College of Agriculture, registration of other students in chemistry courses except those of freshman and sophomore grade (namely, Chemistry 101, 102, 103, 104, 105, 106, 107, 108, 110, 122, 123, 124, 132, 133, 234) is restricted to those having a 3.5 general average exclusive of the basic courses in military training and the required work in physical education and hygiene or an average of at least 3.5 in chemistry courses. Transfer students to be admitted must have a corresponding record in the institution (or institutions) from which they transfer and must maintain a similar average at the University of Illinois. A student minoring in chemistry who can not meet the above requirements may be accepted in junior and senior chemistry courses, provided his adviser requests admission in writing and provided space is available.

# Chemistry

## COURSES FOR UNDERGRADUATES

**.01. General Chemistry.** For students who have no entrance credit in high school chemistry. I, II; 5. Students who have used their high school chemistry for entrance credit and students with 95 or more credit hours receive only 3 hours credit. Prerequisite: One unit of high school physics, or 2½ units of high school mathematics, or credit in Mathematics 111 or 112. BERTIN, JOHNSON, TAMRES.

**.02. General Chemistry.** For students who have had one year of high school chemistry. I, II; 3. Students below the rank of senior receive 5 hours credit provided their high school chemistry has not been used for entrance credit and their final grade in Chemistry 102 is "C" or above. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: One unit of high school chemistry, or equivalent. BERTIN, JOHNSON, TAMRES.

**.03. General Chemistry.** Lectures, recitations, and laboratory. For engineering students who have had no chemistry. I, II; 4. Students who have used their high school chemistry for entrance credit and students with 95 or more credit hours receive only 3 hours credit. Prerequisite: One unit of high school physics, or 2½ units of high school mathematics, or credit in Mathematics 111 or 112. BERTIN, JOHNSON, TAMRES.

**.04. Chemistry of the Metallic Elements.** Lectures, recitations, and laboratory. Limited to students in engineering curricula. I, II; 4. Credit will not be granted to students who have received credit in Chemistry 105 or 106. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. TAMRES, AUDRIETH.

**.05. Inorganic Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students who are not eligible for Chemistry 104 or 106. I, II; 5. Credit in Chemistry 105 will not be granted to students who have received credit in Chemistry 104 or 106. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. BARTOW, JOHNSON.

**.06. Inorganic Chemistry.** Metallic elements. For students in curricula of chemistry, chemical engineering, and ceramic engineering, and chemistry majors who are not premedical students. I, II; 5. Credit will not be granted to students who have received credit in Chemistry 104 or 105. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 101, 102, or 103. BAILAR.

**[07. General Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students in curricula of chemistry or chemical engineering. I; 5. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Excellent high school background in chemistry as shown by a placement examination. MOELLER.

**[08. General Chemistry and Qualitative Analysis.** Lectures, recitations, and laboratory. For students in curricula of chemistry or chemical engineering. II; 5. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Chemistry 107. MOELLER.

**[10. Qualitative Analysis.** Qualitative analysis of metals and inorganic compounds. Open to all students; required of those whose major is chemistry or chemical engineering and those registered in the curriculum of chemistry except students who qualify for Chemistry 107 and 108. I, II; 5. Prerequisite: Chemistry 106. MOELLER.

**[22. Elementary Quantitative Analysis.** Gravimetric and volumetric analysis, stoichiometrical relations, practical applications. For all students in home economics and premedical courses and all others who have not followed the sequence Chemistry 101, 102 or 103, 106, and 110. I, II; 5. Prerequisite: Chemistry 104, 105, or 106. JOHNSON.

**[23. Quantitative Analysis for Engineers.** A course in quantitative analysis designed for the needs of engineers, especially ceramic and metallurgical. I, II; 5. Prerequisite: Chemistry 104 or 105. JOHNSON.

124. **Quantitative Analysis.** Gravimetric and volumetric analysis, modern advanced theor and practice. For all students other than those specified for Chemistry 122 and 12 I, II; 5. Prerequisite: Chemistry 110, or satisfactory record in Chemistry 107 and 10 MALMSTADT.

132. **Elementary Organic Chemistry.** Beginning course in organic chemistry especially fo students in the College of Agriculture. I, II; 3. Prerequisite: Chemistry 101 or 102, o equivalent. TAYLOR.

133. **Elementary Organic Chemistry.** To fulfill the requirements for premedical, pre dental, preveterinary, dietetics, and home economics students. I, II; 5. Prerequisite Chemistry 105 or 110. COREY.

### COURSES FOR ADVANCED UNDERGRADUATES

234. **Organic Chemistry.** For students whose major is in chemistry, or for those registere in the curriculum of chemistry or chemical engineering. I, II; 5. Prerequisite: Chem istry 124. LEONARD, SNYDER.

240. **Elementary Physical Chemistry.** Lectures and problems. I, II; 3. Prerequisite: Chem istry 124; Physics 103 and 104, or equivalent; Mathematics 132 or 137. PHIPPS.

241. **Elementary Physical Chemistry.** Laboratory to accompany Chemistry 240. I, II; Prerequisite: Chemistry 124; Physics 101 and 102, or 103 and 104; Mathematics 13 or 137 and 147. GUTOWSKY, YANKWICH.

245. **Elementary Physical Chemistry.** For students in engineering; not open to chemistr majors. I; 3. Prerequisite: Chemistry 122; Physics 101 and 102, or 103 and 10 Mathematics 132, or 137 and 147. YANKWICH.

246. **Elementary Physical Chemistry.** For students in engineering; not open to chemistr majors. II; 3. Prerequisite: Chemistry 245. YANKWICH.

247. **Elementary Physical Chemistry.** For premedical students only. I, II; 4. Prerequisite Chemistry 122 and 133; Physics 102 or 104, or equivalent. RAY.

249. **Chemistry of Colloids.** Basic principles and applications. II; 3. Prerequisite: Chem istry 122 and 247, or equivalent. RAY.

290. **Thesis.** Limited in general to seniors in the curriculum of chemistry. All student taking this course must present a thesis in order to receive credit. Except under un usual circumstances, only those students registered in Chemistry 290 will be recom mended for honors. I, II; 2 to 6. Prerequisite: Majors in chemistry in the general cu riculum may register if they have completed a minimum of twenty-three hours o chemistry, which must include at least five hours from courses for advanced under graduates. Other students must have the consent of the head of the departmen Each student who desires research must obtain, before the time of registration, specia written permission from the instructor under whom he is to work. ADAMS (in charge)

291. **Elements of Glass Blowing.** Demonstrations and practice in the elementary opera tions of glass blowing. The construction of Pyrex laboratory equipment. I, II; 1. Pre requisite: Junior standing in chemistry. GOODYEAR.

292. **Chemical Literature and Reference Work.** Required of juniors in chemistry; advise for students in the curriculum of chemical engineering; with the consent of the in structor, elective for majors in chemistry. I, II; 1. Prerequisite: Eighteen hours o chemistry; one year of French or German; junior standing. BARTOW.

294. **Chemical Literature and Reference Work.** For those who have had one semeste of Chemistry 292. Required of juniors in chemistry; advised for students in the cur riculum of chemical engineering. I, II; 1. Prerequisite: Chemistry 292. BARTOW.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**315. Inorganic Chemistry.** Nuclear and extra-nuclear atomic structures and their relation to the properties of the elements and of their compounds; types of bonding; survey of the periodic relationships, preparation, and applications of the elements and their compounds. I, II; 3 hours, or ¾ unit. Prerequisite: Fifteen hours of credit in chemistry courses exclusive of courses numbered below 110. AUDRIETH.

**316. Inorganic Chemistry.** Preparation of typical inorganic compounds illustrating special and more advanced techniques. I, II; 2 hours, or ½ unit. Prerequisite: Credit or registration in Chemistry 315. MOELLER, TAMRES.

**324. Introductory Microanalysis and Microscopy.** Lectures and discussions on modern micro and ultramicro apparatus, techniques, and applications; laboratory work on gravimetric and volumetric methods on the micro scale and on volumetric and photometric methods on the ultramicro scale; discussion of estimation and statistical treatment of errors; and applications of statistical methods to experimental design. II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 or 325; senior or graduate standing in chemistry. JOHNSON.

**325. Analytical Chemistry.** A survey course for advanced undergraduate and graduate students requiring further training and review in analytical chemistry. II; 3 hours, or ¾ unit. Prerequisite: Advanced standing in chemistry. LAITINEN.

**326. Chemical Analysis and Treatment of Water.** Chemical and instrumental methods for analysis of water and determination of quality. Chemical principles and processes in water purification and conditioning. Relationship of chemistry of water to municipal and industrial use. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 124. ENGLIS.

**327. Special and Instrumental Methods of Analysis.** Electrical and optical methods, and other advanced analyses. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124, 234, 240, and 241. MALMSTADT.

**328. Chemical Microscopy and Crystallography.** The theory and practice of the use of the optical microscope in chemical identification and analysis, and in the characterization and classification of crystals; principles of crystallization, crystal growth, polymorphism. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 and 240; consent of instructor. JOHNSON.

**329. Food Analysis.** Quantitative organic analysis of food products; alcohols, carbohydrates, fats and oils, cereals, nitrogenous bodies, preservatives, and colors. II; 5 hours, or 1¼ units. Prerequisite: Chemistry 122 or 124, and 133 or 234. ENGLIS.

**336. Organic Chemistry.** Second course. Lectures and recitations. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 124 and 234. MARVEL.

**337. Organic Chemistry.** Laboratory experiments in organic chemistry. I, II; 2 hours, or ½ unit. Prerequisite: Chemistry 234 and 336. TAYLOR.

**338. Systematic Identification of Organic Compounds.** I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 336 and 337, or equivalent. CURTIN.

**342. Elementary Physical Chemistry.** Continuation of Chemistry 240. Lectures. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 240. GUTOWSKY, PHIPPS.

**343. Elementary Physical Chemistry.** Laboratory to accompany Chemistry 342. I, II; 1 hour, or ¼ unit. Prerequisite: Chemistry 240 and 241; credit or registration in Chemistry 342. GUTOWSKY, YANKWICH.

**344. Principles of Chemical Thermodynamics.** Thermodynamics and free energy calculations. I, II; 2 hours, or ¾ unit. Prerequisite: Chemistry 240 and 342, or consent of instructor. PHIPPS, RODEBUSH.

345. **Colloid and Surface Chemistry.** Physical chemistry for colloid systems; properties o surfaces and interfaces; applications. I; 3 hours, or ¾ unit. Prerequisite: Chemistr 342, or consent of instructor. RAY.

346. **Atomic Structure and Valence.** Advanced physical chemistry. I or II; 2 hours, o ½ unit. Prerequisite: Chemistry 240 and 342. YANKWICH.

349. **Colloid and Surface Chemistry.** Laboratory. Quantitative experiments in colloid an surface chemistry. I, II; 1 hour, or ¼ unit. Prerequisite: Credit or registration i Chemistry 345 or 249, or consent of instructor. RAY.

350. **Biochemistry.** Chemistry of carbohydrates, lipids, and proteins; the alimentar processes, blood, tissues, and metabolism. Clinical aspects for prospective students o medicine. Lectures and assigned readings. I, II; 3 hours, or ¾ unit. Prerequisite Chemistry 122 or 124, and 133 or 234; concurrent registration in Chemistry 355 o 354. ROSE, VESTLING.

351. **Techniques of Blood Analysis and Their Applications.** II; 3 hours, or ¾ unit. Pre requisite: Chemistry 350. CARTER.

352. **Biochemistry of Vitamins and Hormones.** II; 3 hours, or ¾ unit. Prerequisite: Chem istry 350. CARTER.

354. **Biochemistry Laboratory.** Laboratory experiments on the chemistry of carbohy drates, lipids, and proteins; the alimentary processes, blood, tissues, and metabolism A less extensive course for those who are unable to devote the time necessary t take Chemistry 355. I, II; 2 hours, or ½ unit. Prerequisite: Chemistry 122 or 124 and 133 or 234; concurrent registration in Chemistry 350.

355. **Biochemistry Laboratory.** (To accompany Chemistry 350.) Experiments on th chemistry of foodstuffs, digestion, blood and tissue composition, and metabolism quantitative analysis of gastric contents, blood, and urine; laboratory quizzes an assigned readings. I, II; 3 hours, or ¾ unit. Prerequisite: Chemistry 122 or 124, and 133 or 234; concurrent registration in Chemistry 350.

358. **Chemistry of Enzymes and Their Action.** Fundamental principles involved in the isolation and characterization of enzymes, the specificity and kinetics of their action and the methods of applying enzymes to the study of metabolic processes. I; 3 hours or ¾ unit. Prerequisite: Chemistry 350 and 355.

395. **History of Science with Particular Reference to Chemistry.** I; 2 hours, or ¼ unit. Prerequisite: Junior standing with twenty hours of laboratory science. BARTOW.

397. **Radiochemistry.** Properties of radioactive nuclei, nature of radioactivity, nuclear reactions, detection equipment, and tracer technique. Lectures. I, II; 2 hours, or ½ unit. Prerequisite: Chemistry 240 and 241. DUFFIELD.

398. **Radiochemistry.** Laboratory to accompany Chemistry 397. I, II; 1 hour, or ¼ unit. Prerequisite: Chemistry 240 and 241; credit or registration in Chemistry 397; consent of instructor. DUFFIELD.

## Chemical Engineering

### COURSES FOR ADVANCED UNDERGRADUATES

261. **Stoichiometry.** A course of lectures and problems on material balances and heat balances combined with an introduction to chemical engineering. I; 3. Prerequisite: Credit or registration in Chemistry 240, or 245 and 246. PETERS.

266. **Inspection Trip.** Inspection of the manufacturing facilities of several chemical and fabrication plants. Duration of trip: three days each semester. I, II; ½. Prerequisite: Senior standing in chemistry or chemical engineering; consent of instructor. PETERS.

267. **Measurements and Instrumentation.** Methods and instruments used for the control of industrial chemical processes. Conferences, laboratory, and readings. I; 2. Prerequisite: Junior standing; Physics 101 and 102, or 103 and 104. WESTWATER.

**90. Thesis.** Limited in general to seniors in the curriculum in chemical engineering. Others must have the consent of the head of the department. All students taking this course must present a thesis in order to receive credit. I, II; 2 to 6. ADAMS (in charge.)

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**63. Unit Operations in Food Technology.** Same as Food Technology 363. Fundamentals of heat transfer, fluid flow, extraction, drying, and other unit operations especially adapted to the food and biochemical industries. Primarily for students in chemistry and food technology; not open to majors in chemical engineering. Lectures and problems. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 240 or 247 and one year of calculus. FINN.

**70. Chemical Engineering Thermodynamics.** The fundamental concepts and laws of thermodynamics. Primarily for students in chemical engineering. II; 3 hours, or ½ unit. Prerequisite: Chemical Engineering 261; Chemistry 240. DRICKAMER.

**71. Principles of Chemical Engineering.** Scientific principles in unit operations of chemical engineering. Lectures, problems, and quizzes. I, II; 4 hours, or 1 unit. Prerequisite: Chemical Engineering 370, or consent of instructor.

**72. Unit Operations Laboratory.** First course. To accompany Chemical Engineering 371. I, II; 2 hours, or ¼ unit. Prerequisite: Credit or registration in Chemical Engineering 371. WESTWATER.

**73. Principles of Chemical Engineering.** Scientific principles in unit operations of chemical engineering. Lectures, problems, and quizzes. I, II; 4 hours, or 1 unit. Prerequisite: Chemical Engineering 371; Chemistry 240. DRICKAMER.

**74. Unit Operations Laboratory.** Second course. To accompany Chemical Engineering 373. I, II; 2 hours, or ¼ unit. Prerequisite: Credit or registration in Chemical Engineering 373. PETERS.

**77. Chemical Engineering Technology.** Study of industrial chemical processes and principles. II; 3 hours, or ½ unit. Prerequisite: Chemistry 240. WESTWATER.

**79. Chemical Engineering Projects.** Laboratory. Development of an individual project. I, II; 2 hours, or ½ unit. Prerequisite: Senior standing in chemistry or chemical engineering. FINN, JOHNSTONE.

**80. Chemical Engineering Calculations.** Numerical and graphical methods for problems in equilibria and kinetics. Lectures and recitations. II; 3 hours, or ¾ unit. Prerequisite: Chemistry 344; Chemical Engineering 371. JOHNSTONE.

**81. Chemical Engineering Plant Design.** Comprehensive problems. I, II; 3 hours, or ½ unit. Prerequisite: Chemical Engineering 373. DRICKAMER, PETERS.

**82. High Pressure Reactions.** Lectures, recitations, and problems. II; 2 hours, or ½ unit. Prerequisite: Chemistry 234 and 344. DRICKAMER.

**83. Applied Electrochemistry.** Use of electric current through solutions for carrying out reactions. Lectures. I; 2 hours, or ½ unit. Prerequisite: Chemistry 234, 336, and 342. SWANN.

**84. Power Plant and Boiler Water Problems.** I; 2 hours, or ½ unit. Prerequisite: Senior standing in chemical engineering. STRAUB.

**85. Bioengineering.** Study of the chemical processes and principles used in the production of foodstuffs, pharmaceuticals, and fine chemicals. Primarily for students in chemical engineering. May be substituted for Chemical Engineering 377 and 374 in the chemical engineering curriculum. Lectures and laboratory. Laboratory may be omitted by graduate students. I; 5 hours, or 1 to 1¼ units. Prerequisite: Credit or registration in Chemical Engineering 373. FINN.

**386. Bioengineering.** Principles of chemical engineering applied to the fermentation and allied industries. May be used as an advanced elective and as a substitute for Chemical Engineering 379 in the chemical engineering curriculum. Lectures and laboratory II; 5 hours, or 1 to 1¼ units. Prerequisite: Bacteriology 300, Chemistry 234 and 240 or consent of instructor. FINN.

**387. Flow of Fluids.** Advanced course. Lectures, recitations, and problems. I; 2 hours, or ¾ unit. Prerequisite: Chemical Engineering 371, or equivalent with consent of instructor.

**388. Heat Transmission.** Advanced course. Lectures, recitations, and problems. I; 2 hours or ¾ unit. Prerequisite: Chemical Engineering 371, or equivalent with consent of instructor. WESTWATER.

## CIVIL ENGINEERING

*Professors:* W. C. HUNTINGTON (Head of Department), H. E. BABBITT, J. G. CLARK, J. S. CRANDELL (Emeritus), E. DANNER, G. H. DELL, J. J. DOLAND, E. E. KING (Emeritus), N. M. NEWMARK, W. A. OLIVER, R. B. PECK, W. H. RAYNER, T. C. SHEDD, J. VAWTER, C. C. WILEY, W. M. WILSON (Emeritus).
*Associate Professors:* E. E. BAUER, J. C. DIETZ, W. W. HAY, F. A. REICKERT (on leave), M. O. SCHMIDT, C. P. SIESS.
*Assistant Professors:* C. P. ATKINS, W. J. AUSTIN, E. R. BRETSCHER, E. J. DAILY, C. S. DANNER, D. A. DAY, L. E. GOODMAN, J. C. GUILLOU, W. S. POLLARD, T. H. THORNBURN.
*Associate:* H. O. IRELAND.
*Lecturer:* K. TERZAGHI.
*Instructors:* J. W. BRISCOE (on leave), H. H. CONNOLLY, J. D. HALTIWANGER, N. KHACHATURIAN, C. H. KOONTZ, J. R. LEEK, G. A. YOUNG.

### COURSES FOR UNDERGRADUATES

**101. Surveying Theory.** Theoretical aspects of plane and topographic surveying; land surveying; computation of areas and volumes. S (first three weeks); 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. DELL, RAYNER, SCHMIDT and others.

**102. Surveying Practice.** Field practice of plane and topographic surveying. The use of the level, transit, and tape in making engineering surveys and topographic maps. Given in Summer Surveying Camp. S; 4. Prerequisite: Civil Engineering 101. DELL, RAYNER, SCHMIDT, and others.

**103. Route Surveying.** Principles of the economic location of railways and highways; horizontal and vertical alinement for route projects; computations for earthwork quantities and distribution; railway track turnouts. I, II; 3. Prerequisite: Credit in Summer Surveying Camp. C. S. DANNER, KOONTZ, SCHMIDT.

**111. Plane Surveying.** Use and care of instruments; practice in the common methods of measuring distance, angles, and elevation; computation of areas and volumes; land surveying procedure and legal principles. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. KOONTZ.

**112. Topographical Surveying.** Contours, map construction, and volumetric estimates from contour maps, astronomical determination of latitude and azimuth; transit stadia methods of topographic surveying; survey and map of an assigned area. I, II; 3. Prerequisite: Civil Engineering 111. SCHMIDT.

**115. General Surveying.** Use and care of surveying instruments; methods of making engineering surveys; computations of areas and volumes; contour problems; transit stadia mapping methods. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; Mathematics 114. C. S. DANNER, KOONTZ, YOUNG.

**7. Surveying for Landscape Architects.** Use and care of surveying instruments; methods of making engineering surveys; computations of areas and volumes. I; 3. Prerequisite: Sophomore standing in landscape architecture. C. S. DANNER.

**8. Surveying for Landscape Architects.** Transit stadia methods for topographic surveys; topographic mapping with the transit and the plane table. II; 3. Prerequisite: Civil Engineering 117. C. S. DANNER.

**0. Engineering in Public Health.** Administration, design, and construction in water supplies; sewerage; domestic, municipal, and industrial wastes; atmospheric pollution; housing, food, camp, emergency, and general sanitation. II; 3. Prerequisite: Sophomore standing. BABBITT, DIETZ.

**0. Building Construction and Materials.** Materials, types of building construction and details. I, II; 3. Prerequisite: Sophomore standing. ATKINS.

## COURSES FOR ADVANCED UNDERGRADUATES

**3. Route Surveying.** Principles of the economic location of railways and highways; horizontal and vertical alinement of route projects, including circular and spiralled curves; computations for earthwork quantities and distribution; railway track turnouts. I, II; 4. Prerequisite: Civil Engineering 112, 115, or 118. KOONTZ, RAYNER.

**6. Photogrammetry.** Principles of perspective and stereoscopic vision; characteristics of aircraft and cameras for mapping work; photographic scales and displaced images; plotting map control from photographers by slotted templets; transferring photographic data by tracing and by projectors; drawing a topographic map from photographs using (a) a linear scale and (b) the stereocomparagraph, the multiplex projector, and other photogrammetric instruments. I; 3. Prerequisite: Civil Engineering 112, or equivalent. RAYNER.

**9. Construction Surveying.** Principles of precise measurements and adjustments of observations as applied to the construction of bridges, buildings, tunnels, sewers, etc. II; 3. Prerequisite: Civil Engineering 103 or 203; Mathematics 132; junior standing. RAYNER.

**0. Highway Engineering Fundamentals.** Basic considerations relating to soils, drainage, and types of highway surfaces. I, II; 3. Prerequisite: Civil Engineering 230. C. S. DANNER, E. DANNER, LEEK, POLLARD.

**2. Highway Geometric and Structural Design.** Geometric design of intersections at grade, rotary intersections, and grade separations; highway width and capacity; structural design of rigid and flexible pavements; current highway research. II; 4. Prerequisite: Civil Engineering 220 and 223, or consent of instructor. POLLARD.

**3. Traffic Engineering.** Driver and vehicle characteristics; traffic accidents and congestion; traffic studies of volume, movement, speed and accidents; traffic regulations speed regulations, stop controls, parking regulations, etc.; traffic control devices—signs, signals, markings, channelization, and lighting; traffic planning of new highway facilities, field problems. I, II; 4. Prerequisite: Civil Engineering 220, or consent of instructor. LEEK, WILEY.

**4. Airport Design.** Requirements of site; arrangement of various facilities; location, soil studies, grading, drainage, and surfacing of runways; general features of hangars, shops, and other buildings. II; 3. Prerequisite: Senior standing in engineering or architecture. REICKERT.

**5. Railroad Construction and Maintenance.** Earthwork and rockwork; roadbed construction; tunnel work; drainage; track materials; track stresses; track design. II; 3. Prerequisite: Civil Engineering 103 or 203, or consent of instructor. HAY.

**6. Railway Location and Operation.** Influences of traffic, alinement, and gradient upon operating expenses. I; 3. Prerequisite: Civil Engineering 103 or 203; senior standing, or consent of instructor. HAY.

227. **Terminals.** Design and operation of railway yards, freight terminals, and passeng stations; bus and truck terminals and stations. I; 2. Prerequisite: Civil Engineerir 103 or 203; senior standing, or consent of instructor. HAY.

229. **Signals.** Railway route and block signaling; automatic train control; interlockin track circuits; signal equipment. Highway fixed signal and traffic actuated signal II; 2. Prerequisite: Civil Engineering 103 or 203. HAY.

230. **Soils and Bituminous Materials.** Production, types, standard specifications, and in portant properties of asphalt and tar. Identification, classification, and physic properties of earth materials; character of natural soil deposits and techniques sub-surface exploration. Laboratory practice in testing of soil, asphalt, and tar. I, I 2. Prerequisite: Junior standing in engineering or architecture. BAUER, POLLAR THORNBURN.

231. **Advanced Highway Materials.** Advanced work in testing of bituminous material design of asphaltic concrete mixes, soil-cement mixes, soil-bituminous mixes, ar Portland cement concrete mixes containing entrained air. I; 2. Prerequisite: Civ Engineering 230 and 235. BAUER.

235. **Plain Concrete.** Production, properties, specification, requirements, and uses of Por land cement, aggregates, mixing water, and admixtures; proportioning; field practic in the production of concrete; laboratory practice including tests on materials ar concrete of various proportions; calculations and graphs based on values from co crete proportioning projects. I, II; 2. Prerequisite: Junior standing in engineerin or architecture. BAUER, KOONTZ, LEEK, POLLARD, YOUNG.

237. **Estimates and Costs.** Economic selection; construction cost estimating, direct ar overhead costs; cost keeping; construction by force account and contract; time sche ules and progress charts; valuations. I, II; 2. Prerequisite: Senior standing in enginee ing or architecture. ATKINS.

238. **Construction Equipment and Methods.** Types of construction equipment; use limitations, and proper selection; production capacities; ownership and operatir costs. I, II; 3. Prerequisite: Senior standing in engineering or architecture. E. DANNE DAY.

239. **Construction Planning and Management.** Construction organization, economic and finances; requirements for equipment, materials, and personnel; plant layout progress schedules; concrete forms; false work; cofferdams; control of operations. I 4. Prerequisite: Civil Engineering 237 and 238. DAY.

240. **Water Supply.** Finances, hydraulics, demands, sources, reservoirs, pipe lines, pum ing machinery, materials, distribution systems. I, II; 4. Prerequisite: Theoretical ar Applied Mechanics 221, 232, and 234; Mechanical Engineering 201. BABBITT, CO NOLLY, DIETZ.

241. **Sewerage.** Sewerage systems, surveys and plans, hydraulics, house sewerage, rainfa and storm-water flow, size and capacity of sewers, appurtenances, estimates ar specifications, construction. I, II; 3. Prerequisite: Theoretical and Applied Mecha ics 232 and 234. BABBITT, CONNOLLY, DIETZ.

248. **Water Supply and Sewerage.** Development, design, construction, and maintenan of municipal water works and sewerage works not including water purification or sev age treatment. I, II; 4. Prerequisite: Theoretical and Applied Mechanics 232 and 23 CONNOLLY, DIETZ.

250. **Hydrology.** Precipitation, evaporation, transpiration, deep seepage, runoff, h draulics of rivers and small streams; use of current meter, float, weir, etc. I; 3. Pr requisite: Senior standing. DOLAND, YOUNG.

252. **Water Resources, Planning and Development.** Purposes and techniques of plannir water resources development; methods of evaluating the engineering and econom aspects of water conservation projects developed through the examination of actu proposals. I; 3. Prerequisite: Credit or registration in Civil Engineering 250. DOLAN

**60. Structural Engineering.** Design of steel, reinforced concrete, and timber structures. For students in other departments. Civil engineers receive no credit in this course. I; 3. Prerequisite: Senior standing in engineering or architecture. BRETSCHER.

**61. Structural Analysis.** Analysis of stresses in statically determinate structures. I, II; 4. Prerequisite: Credit or registration in Theoretical and Applied Mechanics 221. BRETSCHER, DAILY, DAY, HALTIWANGER, KHACHATURIAN.

**62. Structural Analysis.** An introduction to statically indeterminate structures. I, II; 3. Prerequisite: Civil Engineering 261. BRETSCHER, DAILY, DAY, HALTIWANGER, KHACHATURIAN.

**63. Elementary Structural Design.** An introduction to structural design; design of flexural members in steel, concrete, and timber. I, II; 2. Prerequisite: Theoretical and Applied Mechanics 221; credit or registration in Civil Engineering 261. BRETSCHER, DAILY, DAY, KHACHATURIAN.

**64. Structural Design.** Theory of design, and design of structures of steel, concrete, and timber as applied to industrial buildings and short or medium span highway truss bridges. I, II; 5. Prerequisite: Civil Engineering 262 and 263. BRETSCHER, DELL.

**65. Structural Design.** Continuation of Civil Engineering 264. Devoted principally to bridges. I, II; 4. Prerequisite: Civil Engineering 264. CLARK, OLIVER.

**70. Foundations and Retaining Walls.** Evaluation of subsoil conditions; choice of type and basis for design of foundations; earth pressures and retaining wall design. I, II; 3. Prerequisite: Civil Engineering 261 and 263. DAILY, IRELAND.

**71. Earth and Masonry Structures.** Analysis and design of masonry dams; earth dams and embankments, and substructure for bridges and buildings. I, II; 2. Prerequisite: Credit or registration in Civil Engineering 270. DAILY.

**90. Contracts and Specifications.** Engineering relations; the law of contracts; business and technical clauses used in specifications. I, II; 2. Prerequisite: Senior standing in engineering or architecture. DAY, HAY.

**91. Thesis.** Investigation or design. May be substituted for certain technical subjects in any of the six options of the senior year. I; 1 to 3. Prerequisite: Senior standing; consent of head of department.

**92. Thesis.** Continuation of Civil Engineering 291. Investigation or design. May be substituted for certain technical subjects in any of the six options of the senior year. II; 1 to 3. Prerequisite: Senior standing; consent of head of department.

**93. Special Problems.** Individual investigations or studies of any phase of civil engineering selected by the student and approved by the department. I; 1 to 3. Prerequisite: Senior standing.

**94. Special Problems.** Individual investigations or studies of any phase of civil engineering selected by the student and approved by the department. II; 1 to 3. Prerequisite: Senior standing.

**95. Professional Practice.** A series of lectures by distinguished engineers on all phases of civil engineering. Lectures will be given about once every two weeks. I; no credit. Prerequisite: Junior standing.

**96. Professional Practice.** A series of lectures by distinguished engineers on all phases of civil engineering. Lectures will be given about once every two weeks. II; no credit. Prerequisite: Junior standing.

**99. Inspection Trip.** I; no credit. Prerequisite: Senior standing.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**132. Engineering Properties of Soils.** Laboratory practice in the testing, classification, and identification of soils; engineering soil surveys and explorations; and sampling. I, II;

2 hours, or ½ unit. Prerequisite: Senior standing in engineering, or consent of i structor. BAUER.

**344. Water and Sewage Treatment.** Principles, design, and operation of water purificati and sewage treatment works. I; 5 hours, or 1 unit. Prerequisite: Credit or registrati in Bacteriology 104 and Civil Engineering 240 or 241. BABBITT, DIETZ.

**345. Public Health Engineering.** Principles of sanitation, waste collections, and disposa sanitary regulations; biostatistics. II; 3 hours, or ½ unit. Prerequisite: Credit or regi tration in Bacteriology 104 and Chemistry 122. BABBITT.

**351. Drainage and Flood Control.** Land drainage, river improvement, flood control. I 3 hours, or ½ unit. Prerequisite: Civil Engineering 250. DOLAND.

**355. Water Power Engineering.** Analysis of hydrologic and power market data; sele tion of site and hydraulic machinery; preliminary design of water passages and powe house; formal reports on projects. II; 4 hours, or 1 unit. Prerequisite: Civil Enginee ing 250. DOLAND, YOUNG.

**356. Hydraulic Engineering Laboratory.** Fundamental principles, operation, and use model laboratories, dimensional analysis, hydraulic similitude, theory and design hydraulic models. II; 3 hours, or ¾ unit. Prerequisite: Theoretical and Applied M chanics 232 and 234. GUILLOU.

**359. River Hydraulics.** Gaging of streams, stream erosion and deposition, use of groin revetments and mats, stream systems, and river navigation. I; 3 hours, or ¾ un Prerequisite: Theoretical and Applied Mechanics 232. GUILLOU.

**361. Statically Indeterminate Structures.** Elastic theory and its applications to statical indeterminate structures. I, II; 3 hours, or ½ unit. Prerequisite: Civil Engineerir 262; credit or registration in Civil Engineering 264. CLARK, OLIVER.

**362. Statically Indeterminate Structures.** Continuation of Civil Engineering 361. I, II; hours, or ½ unit. Prerequisite: Civil Engineering 361, or 262 and consent of instru tor. CLARK, VAWTER.

**373. Introduction to Soil Mechanics.** Investigation of engineering characteristics of sul surface conditions; principal theories of soil mechanics; application to design of r taining walls, open cuts, drainage systems, and stability of slopes. I; 4 hours, or 1 uni Prerequisite: Credit or registration in Civil Engineering 270, or consent of instructo PECK.

**374. Applied Soil Mechanics.** Application of soil mechanics to foundations of building compaction of embankments, and construction of culverts and tunnels. II; 4 hours, 1 unit. Prerequisite: Credit or registration in Civil Engineering 270, or consent instructor. PECK.

**375. Engineering Aspects of Surficial Soils.** Use of geologic, pedologic, and airphoto i formation for identification and evaluation of the engineering properties of surfici soils. II; 4 hours, or 1 unit. Prerequisite: Civil Engineering 230, or consent of instru tor. THORNBURN.

## CLASSICS

**(Including Greek and Latin)**

*Professors:* J. L. HELLER (Head of Department), B. E. PERRY, A. TURYN.
*Associate Professor:* R. P. OLIVER.
*Assistant Professor:* F. D. LAZENBY.
*Instructor:* ELEANOR G. HUZAR.
*Assistant:* R. A. SWANSON.

### MAJOR IN GREEK

**Major:** Twenty hours, excluding Greek 150, 161, and 318. In addition, Classics 301-302 is strongly recommended as an elective.

**Minors:** Twenty hours chosen from not more than two of the following: foreign language (Latin being especially recommended), English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

### MAJOR IN LATIN

**Major:** Twenty hours, excluding Latin 101, 102, 103, and 162, and including six hours in translation courses for advanced undergraduates and graduates. In addition, Classics 301-302 is strongly recommended as an elective. In addition to these twenty hours in the language, students whose major is Latin and who plan to teach the subject are also required to take Classics 101, Latin 162, and a three-hour course in the history of the Roman Republic (see History 383).

**Minors:** Twenty hours chosen from not more than two of the following: foreign language (Greek being especially recommended), English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

### MAJOR IN THE CLASSICS

**Major:** Twenty hours in Greek and Latin, excluding Greek 150, 161, 318, Latin 101, 102, 103, and 162. At least six hours must be taken in the secondary language, and the remaining hours in the primary language. In addition, Classics 301-302 is strongly recommended as an elective.

**Minors:** Twenty hours chosen from not more than two of the following: foreign language, English literature, history, library science, and philosophy. At least eight hours must be taken in each subject, if two are chosen.

## Classics in Translation

### COURSES FOR UNDERGRADUATES

NOTE: The following courses presuppose no knowledge of the Greek or Latin language and are open to all students. They are not to be counted toward a major in Greek, Latin, or the Classics. Other courses in the department requiring no knowledge of Greek or Latin are Greek 150, 161, 318, and Latin 162.

**101. Mythology of Greece and Rome.** Lectures and readings. I; 2. LAZENBY.

**110. Greek Drama in English Translation.** II; 2. LAZENBY.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Classical Literary Traditions I.** Greek literature from Homer to Aristotle. I; 3 hours, or ½ unit. Prerequisite: Completion of the foreign language requirement in the College of Liberal Arts and Sciences, or the equivalent. This course with Classics 302 meets the general education requirement in humanities in the College of Liberal Arts and Sciences. PERRY.

**302. Classical Literary Traditions II.** Literary forms in the Alexandrian and Roman periods. II; 3 hours, or ½ unit. Prerequisite: Completion of the foreign language requirement in the College of Liberal Arts and Sciences, or the equivalent. This course with Classics 301 meets the general education requirement in humanities in the College of Liberal Arts and Sciences. HELLER.

## Greek

### COURSES FOR UNDERGRADUATES

**101. Elementary Greek.** An introduction to the fundamentals of classical Greek, including the reading of simple prose. I; 4. HUZAR.

**102. Elementary Greek.** Continuation of Greek 101. Grammar and reading. II; 4. Prerequisite: Greek 101, or equivalent. HUZAR.

**150. Greek and Roman Sports.** Illustrated lectures and readings. Knowledge of Greek is not required. I, II; 2. HUZAR.

**161. Classical Archaeology.** Monuments and material remains illustrating the development of ancient art. I; 2. Prerequisite: Sophomore standing. Knowledge of Greek or Latin is not required. LAZENBY.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Second Year Greek.** Reading of narrative prose. I; 3. Prerequisite: Greek 102, or equivalent. TURYN.

**202. Second Year Greek.** Continuation of Greek 201. Introduction to epic Greek; reading of Homer. II; 3. Prerequisite: Greek 201, or equivalent. TURYN.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**318. Elements of Technical Terminology.** Presentation and analysis of Greek and Latin prefixes, suffixes, and root-words basic in the vocabulary of modern science, especially botany, psychology, zoology, and medicine. I, II; 3 hours, or ½ unit. Prerequisite: Completion of the foreign language requirement in Liberal Arts and Sciences, or the equivalent, or completion of twenty hours of science or architecture. Knowledge of Greek or Latin is not required. HELLER.

**391. Readings in Greek Literature.** Supervised reading, topics to be chosen according to need, in consultation with the adviser. This course may be repeated for credit to a maximum of 12 hours or 2 units. Suggested topics (others are possible): Herodotus, Tragedy, Comedy, Lyric Poetry, Aristotle, Menander, Oratory, New Testament, Survey of Greek Literature. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Two years of college Greek; consent of instructor. STAFF.

## Latin

### COURSES FOR UNDERGRADUATES

**101. Elementary Latin.** Grammar and reading. For students who have had no work in Latin. I; 4. Students with 95 or more credit hours receive only 3 hours credit. OLIVER.

**102. Elementary Latin.** Continuation of Latin 101. Grammar and reading of elementary prose. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Latin 101, or one year of high school Latin. SWANSON.

**103. Intermediate Latin.** Review of grammar, reading of easy narrative prose. I, II; 4. Prerequisite: Latin 102, or two years of high school Latin. Students with three years of high school Latin may also register for this course. HUZAR, LAZENBY.

**104. Intermediate Latin.** Continuation of Latin 103. Reading of narrative prose with an introduction to verse. I, II; 4. Prerequisite: Latin 103, or three or four years of high school Latin. HUZAR, LAZENBY.

**113. Latin Composition.** Grammatical drill and practice in simpler forms of expression. Required of those receiving the recommendation of the department as teachers. I; 2. Prerequisite: Credit or registration in Latin 103, or three years of high school Latin. SWANSON.

**114. Latin Composition.** Continuation of Latin 113. Required of those receiving the recommendation of the department as teachers. II; 2. Prerequisite: Latin 113. TURYN.

**162. Roman Antiquities.** Monuments and material remains illustrating the public and private life of the Romans. II; 2. Prerequisite: Sophomore standing. Knowledge of Latin not required. LAZENBY.

#### COURSES FOR ADVANCED UNDERGRADUATES

**201. Survey of Latin Literature.** The Republican Period. I; 3. Prerequisite: Latin 104, or four years of high school Latin. HELLER.

**202. Survey of Latin Literature.** Continuation of Latin 201. The Imperial Period. II; 3. Prerequisite: Latin 104, or four years of high school Latin. HELLER.

**291. Honors Course.** Thesis or a special course of study approved by the department. I; 2. Prerequisite: Senior standing; fourteen hours of Latin acceptable for a major. OLIVER.

**292. Honors Course.** Thesis or a special course of study approved by the department. II; 2. Prerequisite: Senior standing: fourteen hours of Latin acceptable for a major. OLIVER.

#### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Advanced Latin Composition.** Practice in the writing of Latin prose. Required of those receiving the recommendation of the department as teachers. I; 2 hours, or ½ unit. Prerequisite: Twelve hours of Latin acceptable for a major. TURYN.

**312. Advanced Latin Composition.** Practice in the writing of Latin prose. II; 2 hours, or ½ unit. Prerequisite: Latin 311. TURYN.

**391. Readings in Latin Literature.** Supervised reading, topics to be chosen according to need, in consultation with the adviser. This course may be repeated for credit to a maximum of 12 hours or 2 units. Suggested topics (others are possible): Livy, Horace, Vergil, Cicero's *Orations*, Seneca, Ovid, Cicero's *Essays*, Patristic Latin, Medieval Latin. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Three years of college Latin, or the equivalent; consent of instructor. STAFF.

## DAIRY SCIENCE

*Professors:* G. W. SALISBURY (Head of Department), R. W. BARTLETT, W. B. NEVENS, M. J. PRUCHA (Emeritus), C. S. RHODE, H. A. RUEHE, W. W. YAPP.
*Associate Professors:* J. G. CASH, K. E. GARDNER, R. G. HANSEN, N. L. VANDEMARK.
*Assistant Professors:* M. H. ALEXANDER, L. R. FRYMAN, K. E. HARSHBARGER, R. L. HAYS, K. A. KENDALL, W. O. NELSON, E. E. ORMISTON, P. P. SOMERS, R. W. TOUCHBERRY, W. A. WOOD.
*Associate:* S. G. MENEFEE (on leave).
*Instructor:* B. L. LARSON.
*Assistants:* F. N. BAKER, M. W. H. BISHOP, E. M. CRAINE, DOROTHY J. DILLON, W. M. DILLON, JR., W. C. KINNEY, JR., S. A. NARROD, M. PURKO, G. H. ROLLINS, W. J. RUTTER, G. S. STUFF, K. A. TABLER.

#### COURSES FOR UNDERGRADUATES

**100. Introduction to Dairy Production.** Survey of industry; breeds of dairy cattle; selection, feeding, and management of herds. Lecture, quiz, and laboratory. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. GARDNER, HARSHBARGER, KENDALL.

**104. Dairy Cattle Judging.** Selection and judging. Lectures, recitations, and laboratory. I, II; 2. Prerequisite: Dairy Science 100, or consent of instructor. ORMISTON.

**110. Plant and Animal Genetics.** Same as Agronomy 110, Animal Science 110, and Horticulture 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104. ALEXANDER, DAYTON, ROBERTS, TOUCHBERRY.

**150. General Dairy Bacteriology.** Relationship of bacteriology to milk and milk products; milk inspection; dairy farm and milk plant sanitation. II; 2. Prerequisite: Bacteriology 104; sophomore standing. NELSON.

**151. General Dairy Bacteriology.** Determination of numbers and types of bacteria in milk; milk fermentations. II; 3. Prerequisite: Bacteriology 104; credit or registration in Dairy Science 150. NELSON.

**180. Chemical Control Methods for Dairy Plants.** Lectures, recitations, problems, and laboratory. II; 3. Prerequisite: Chemistry 101. HANSEN.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Reproduction, Genetics, and Improvement of Dairy Cattle.** A foundation course in the physiology and endocrinology of reproduction, the inheritance of physical and production characteristics of dairy cattle, and a consideration of dairy cattle improvement. I; 3. Prerequisite: Dairy Science 100. SALISBURY.

**202. Feeding Dairy Cattle.** Feeding of dairy cattle. Lectures, laboratories, tours, and problems. II; 3. Prerequisite: Dairy Science 100. GARDNER.

**204. Dairy Production.** Special ten-week course for students specializing in the teaching of vocational agriculture. II; 2. Prerequisite: Dairy Science 100. KENDALL, YAPP.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Problems in Dairy Farming.** Dairy farm operation, including field and building arrangement, cropping systems, herd management, sanitary milk production, and farm marketing problems. Lectures, quiz, assigned readings, and problems. I; 3 hours, or ¾ unit. Prerequisite: Dairy Science 100 and 202. YAPP.

**320. Special Problems.** I, II; 5 hours, or 1 unit. Prerequisite: Senior standing; approval of head of department. GARDNER, HANSEN, HAYS, KENDALL, NELSON, NEVENS, SALISBURY, TOUCHBERRY, VANDEMARK, WOOD, YAPP.

**330. Reproduction and Artificial Insemination of Farm Animals.** The anatomy and physiology of reproduction in farm animals, the principles of artificial insemination, and the factors affecting conception in natural and artificial breeding. I; 3 hours, or ¾ unit. Prerequisite: Zoology 104 and either Dairy Science 100 or Animal Science 101. VANDEMARK.

**334. Marketing Dairy Products.** Same as Agricultural Economics 334 and Marketing 334. The dairy industry in our national economy; factors affecting per capita consumption; price plans and policies; expanding markets; trade associations and labor unions; looking ahead in the milk business. Inspection trip; estimated expense, $5. II; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, or Marketing 101, or twelve hours of dairy science or dairy technology. BARTLETT.

**350. Advanced Dairy Bacteriology.** Bacteriology of dairy products, normal and abnormal. I; 4 hours, or 1 unit. Prerequisite: Bacteriology 104; Chemistry 132, or equivalent. NELSON, WOOD.

**380. Composition of Dairy Products.** I; 3 hours, or ¾ unit. Prerequisite: Chemistry 132. HANSEN.

**381. Dairy Biochemical Laboratory Methods.** Theory and application of dairy biochemical laboratory methods: proximate analysis, spectrophotometry, chromatography, protein separation, microtechniques, micro respiration, and others. II; 4 hours, or 1 unit. Prerequisite: Quantitative analysis, organic chemistry, and consent of instructor. Biochemistry recommended. HANSEN.

## Dairy Technology

(See Food Technology)

## Dance

(See Physical Education)

# DIVISION OF GENERAL STUDIES

*Professors:* R. G. BONE (Director of Division), R. H. BAKER (Emeritus), H. R. BOWEN, M. T. HERRICK, H. R. WANLESS.
*Associate Professors:* H. L. ANDREWS, W. HABBERTON, L. S. HULTZÉN, O. E. KUGLER, J. L. MCCONNELL, J. M. MCCRIMMON, W. E. MORRELL.
*Assistant Professors:* F. COSTIN, H. E. GULLEY.
*Instructors:* J. F. GLAWE, F. H. JACKSON, A. TRESS LUNDMAN, O. R. RANKIN.
*Assistants:* R. T. CALEFF, D. GARRETT, W. H. HITT, J. F. KINGSTON, P. C. LIPPOLD, P. I. MITTERLING, C. A. POXON, R. C. TIMBLIN, J. M. WALKER.

### COURSES FOR UNDERGRADUATES

**111. Verbal Communication.** Writing, reading, speaking, and listening; study of theory and practice. I; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Passing grade in Rhetoric 101 placement examination, or passing grade in Rhetoric 100. This course meets the requirements for Rhetoric 101. GULLEY, HULTZÉN, KINGSTON, LUNDMAN, MCCRIMMON (Chairman).

**112. Verbal Communication.** A continuation of Division of General Studies 111. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 111. This course meets the requirements for Rhetoric 102. GULLEY, HULTZÉN, KINGSTON, LUNDMAN, MCCRIMMON (Chairman).

**121. History of Civilization.** Survey of the social, economic, political, cultural, and intellectual life of the western world from the earliest times to the end of the seventeenth century. I; 4. Students with 95 or more credit hours receive only 3 hours credit. HABBERTON (Chairman), JACKSON, MITTERLING.

**122. History of Civilization.** A continuation of Division of General Studies 121, studying of the period from the last quarter of the seventeenth century to the present day. II; 4. Students with 95 or more credit hours receive only 3 hours credit. HABBERTON (Chairman), JACKSON, MITTERLING.

**131. Biological Science.** Introduction to the biological sciences, their aims, content, and methods, with special reference to their application to human life and civilization. I; 4. Students with 95 or more credit hours receive only 3 hours credit. ANDREWS, CALEF, GARRETT, GLAWE, KUGLER (Chairman), LIPPOLD, WALKER.

**132. Biological Science.** A continuation of Division of General Studies 131. II; 4; Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 131 or consent of instructor. ANDREWS, CALEF, GARRETT, GLAWE, KUGLER (Chairman), LIPPOLD, WALKER.

**141. Physical Science.** A study of the fundamental principles in the fields of astronomy, chemistry, geology, and physics; the importance of these principles in a scientific age and their influence on modern life. I; 4. Students with 95 or more credit hours receive only 3 hours credit. HITT, MORRELL (Chairman), POXON, RANKIN, WANLESS.

**142. Physical Science.** A continuation of Division of General Studies 141. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Division of General Studies 141 or consent of instructor. HITT, MORRELL (Chairman), POXON, RANKIN, WANLESS.

**151. Social Science.** Major social groupings, relations, and institutions in contemporary civilization; fundamental resources of society; social and economic institutions. I; 4. Prerequisite: Sophomore standing, or consent of instructor. BOWEN (Chairman), MCCONNELL, TIMBLIN.

**152. Social Science.** National and international political institutions; social change and its consequences; dominant contemporary issues; the role of the educated individual in the modern world. II; 4. Prerequisite: Division of General Studies 151 or equivalent, or consent of instructor. BOWEN (Chairman), MCCONNELL, TIMBLIN.

**161. Literature and Fine Arts.** Introduction to the general principles of art by analysis of selected work of literature, music, painting, sculpture, and architecture. I; 4. Prerequisite: Sophomore standing, or consent of instructor. HERRICK.

**162. Literature and Fine Arts.** A continuation of Division of General Studies 161. II; 4. Prerequisite: Division of General Studies 161, or consent of instructor. HERRICK.

**171. General Division Psychology.** A description and explanation of the psychological principles of everyday living, with emphasis on how our behavior is motivated, how we learn, intelligent behavior, and personality; consideration of the application of psychology to various social issues. This course plus a course in philosophy meets the psychology-philosophy sequence requirement. I, II; 4. Prerequisite: Sophomore standing, or consent of instructor. COSTIN.

## ECONOMICS

*Professors:* H. K. ALLEN (Chairman of Department), V L. BASSIE, J. F. BELL, E. L. BOGART (Emeritus), H. R. BOWEN, P. H. BROWN, W. E. CHALMERS, J. F. DUE, H. M. GRAY, C. A. HICKMAN, D. L. KEMMERER, F. E. LEE (on leave), S. LITMAN (Emeritus), D. P. LOCKLIN, E. B. MCNATT, W. H. MCPHERSON, R. I. MEHR, F. MODIGLIANI, W. A. NEISWANGER, R. M. NOLEN, MARGARET G. REID (on leave), D. W. SMYTHE, G. A. STEINER (on leave), C. M. THOMPSON (Emeritus), P. M. VAN ARSDELL, E. T. WEILER.

*Associate Professors:* GRACE BECKETT, R. FERBER, D. P. FLANDERS, R. W. HARBESON, F. B. HAWORTH, G. KLEINER, R. W. MAYER, J. L. MCCONNELL, R. C. OSBORN, D. W. PADEN, J. B. PARRISH, W. C. ROBB.

*Assistant Professors:* R. CAMPBELL, J. A. COCHRAN, R. EISNER, R. GIBSON, HARRIET D. HUDSON, R. H. MCEVOY, L. C. SARTORIUS, JANET L. WESTON.

*Associate:* D. H. HOOVER (Emeritus).

*Instructors:* E. T. CAMMACK, A. S. HALL.

*Assistants:* J. W. BEALL, R. BRUMBERG, P. M. CARROLL, L. V. CONWAY, ESTHER DUVALL, E. L. ECKLES, R. P. GEISLER, R. A. HEDGES, J. E. HOWELL, W. M. MERRILL, GLORIA V. MILLER, D. A. NEUMANN, M. O. NEWMAN, R. D. PASHEK, H. R. POWELL, J. T. WOODWARD, S. T. WORLAND.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** In addition to Economics 102 and 103, or Economics 108 and 109, twenty hours of courses in economics for which Economics 102 or 108 is a prerequisite, including Economics 300 and two other courses chosen from the following: Economics 210, 214, 215, 216, 218, 224, 226, 228, 238, 239, 240, 246, 248, 250, 254, 257, 260, 262, 272,

280, 288, 290, 291, 292, 293, 301, 306, 312, 328, 336, 342, 378, 379, 380, 384, 390, 391. The prerequisite of Economics 102 or 108 is waived for Economics 336.

Liberal Arts and Sciences majors in economics are advised strongly to elect Economics 171 and Accountancy 201. Economics 171 is acceptable toward the twenty-hour major but Accountancy 201 is not acceptable toward the major requirement.

**Minors:** Twenty hours in any one or two of the following subjects: geography, geology, history, mathematics, philosophy, political science, psychology, social work, sociology and anthropology. At least eight hours must be taken in each subject, if two are chosen. The curriculum in international affairs will be accepted as a minor and also the program in Latin-American studies.

### COURSES FOR UNDERGRADUATES

NOTE: Economics 100 is open only to non-commerce freshmen. Economics 102 and 103, or Economics 108 and 109, are the fundamental courses in economics. Economics 102 and 103 are required of all Commerce students. Liberal Arts majors in economics are strongly advised to take Economics 102 and 103, and are required to take either these or Economics 108 and 109. Students who expect to do advanced work in economics should take the two semesters of introductory economics in their sophomore year.

Advanced courses in economics may be grouped in several rather distinct classifications in which students may find it profitable to concentrate in their third and fourth years. The following are suggested: economic theory, history, and statistics; public and private finance, including insurance; labor; foreign trade; public utilities and transportation.

**100. Introduction to Business.** An introductory course on the principles and practices of our economic system from the point of view of the business manager. Open to non-commerce freshmen only. I, II; 3. WESTON.

**102. Principles of Economics.** Principles of production, supply, demand, value, price, distribution. I, II; 3. Prerequisite: One year of college work. WEILER and others.

**103. Principles of Economics.** Principles of economics as applied to exchange, money, banking, price changes, governmental finance, etc. I, II; 3. Prerequisite: Economics 102. WEILER and others.

**108. Elements of Economics.** A brief presentation of the allocation of economic resources by the price system; money and banking; international trade; national income determination; public finance. For non-commerce students only. I, II; 3. Prerequisite: One year of college work. WEILER and others.

**109. Principles of Economics.** A continuation of the introductory course in economics for non-commerce students. This course, together with Economics 108 constitutes a two-semester sequence in elementary economics. For non-commerce students only. I, II; 3. Prerequisite: Economics 108. ALLEN.

**136. Economic History of the United States.** Main events and leading personalities in the economic development of the United States as seen in the westward movement, the growth of industry, agriculture, commerce, finance, transportation, the trust movement, and labor from 1790 to the present. I, II; 3. KEMMERER and others.

**138. Introduction to the Economic History of Modern Europe.** The evolution of the economic institutions of modern Europe in relation to the development of industry, commerce, transportation, and finance in the principal European nations. I, II; 3. CAMPBELL.

**170. Elements of Statistics.** Methods of collection—presentation and interpretation of quantitative economic data, averages, dispersion, index numbers, reliability of statistics, time series analysis, and simple correlation. Commerce students are required to register in Economics 170; they will not receive credit for Psychology 135 or Mathematics 161. I, II; 3. Prerequisite: Economics 102 or 108; sophomore standing. NEISWANGER and others.

171. **Applied General Statistics.** An introduction to elementary statistical methods as applied in the social sciences. The following topics will be considered: scientific method, quantitative measurement in the social sciences, analysis of frequency distribution, sampling, measuring relationship between two variables, analysis of time series, and uses of statistics in government, industry, and in the social sciences. I, II; 3. Prerequisite: Sophomore standing. PADEN.

### COURSES FOR ADVANCED UNDERGRADUATES

210. **Comparative Economic Systems.** The economics of capitalism, socialism, communism, and fascism. I, II; 3 Prerequisite: Economics 102 and 103, or 108. MCCONNELL.

214. **Public Finance and Taxation.** Economic principles as they apply to public expenditures, public revenues, public borrowing, and administration of public funds. I, II; 3. Prerequisite: Economics 102 and 103, or 108. ALLEN, DUE.

215. **Federal Fiscal and Tax Policy.** Federal expenditure and tax policy as it affects the economy; fiscal policy in depression and prosperity, with emphasis on the problems of defense financing and fiscal measures to control inflation; problems of the national debt and Federal tax reform. Designed for non-commerce as well as commerce students. I; 3. Prerequisite: Economics 102 and 103, or 108. DUE.

216. **State and Local Taxation in Illinois.** State and local revenues; tax administration; state aid; state-administered locally shared taxes; state control of local taxes and finances; governmental accounting, auditing, budgeting, and reporting; purchasing; and debt administration. I; 3. Prerequisite: Economics 102 and 103, or junior standing. ALLEN.

218. **Current Economic Problems (National and International).** A survey of important economic problems such as money and banking, methods of finance, labor, transportation, and international trade. For non-commerce students only. I, II; 3. Prerequisite: Economics 102 and 103, or 108. GRAY.

224. **World Markets.** Chief markets of the world, with special reference to the United States; materials of commerce. II; 3. Prerequisite: Economics 102 and 103, or 108. BECKETT.

228. **International Finance.** The United States balance of international payments and world supply of and demand for dollars; foreign exchange, exchange controls; United States international investments; exporting and importing; financial shipments. I, II; 3. Prerequisite: Economics 102 and 103, or 108. KLEINER.

238. **Economic Development of Modern Europe I.** Evolution of the major elements in economic life: agricultural, extractive, and manufacturing industries; transportation, marketing, and finance. How the European experiences gave rise both to orthodox and divergent economics; economic history as expressing dynamic economics. Early modern economic origins in England and France from 1500 to the present. I; 3. Prerequisite: Economics 102 and 103, or 108.

239. **Economic Development of Modern Europe II.** Evolution of the major elements in economic life; agricultural, extractive, and manufacturing industries; transportation, marketing, and finance. How the European experiences gave rise both to orthodox and divergent economics; economic history as expressing dynamic economics. Germany, Russia, Italy, Spain, and Ireland. II; 3. Prerequisite: Economics 102 and 103, or 108.

240. **Labor Problems.** A survey of the nature and causes of the problems of the American wage earner: economic insecurity, wages, hours, substandard workers; and the efforts of wage earners and society through organization and legislation to solve these problems. I, II; 3. Prerequisite: Economics 102 and 103, or 108. MCNATT and others.

246. **Economics of Trade Unionism.** Economic problems and issues involved in trade union organization and operation in this country and abroad, with emphasis on public policy. I; 3. Prerequisite: Economics 102 and 103, or 108. PARRISH.

**248. Personnel Administration.** A study of employer-employee relationships: job analysis; recruitment, selection, training, transfer, promotion, and dismissal of employees; industrial unrest; working hours; wage plans and policies; employee health, interest, and morale; employee stabilization; collective bargaining and recent legislation; personnel services and administration in the public service. I, II; 3. Prerequisite: Economics 102 and 103, or 108. ROBB and others.

**250. Money, Credit, and Banking.** A study of the monetary and banking systems. The Federal Reserve System, price fluctuation, foreign exchange financing, and specialized financial institutions in the United States. I, II; 3. Prerequisite: Economics 102 and 103, or 108. NOLEN and others.

**252. Banking Practice in the United States.** A study of the functions, operations, policies, organization, management, and supervision of banks. II; 3. Prerequisite: Economics 250 and 254. NOLEN.

**253. Investment Banking.** Role of investment banking in the financial organization; investment banking houses; relation of investment banking to other financial institutions; regulation of investment banking and the security markets; current problems and developments in investment banking. II; 3. Prerequisite: Economics 250 and 254. MAYER.

**254. Business Finance.** Nature of business finance and its relation to economics, accounting, and law; legal nature and forms of business enterprise; capital, capitalization, and financial plan; financial analysis and interpretation; initial financing; refinancing; working capital; income administration, including dividend policies; expansion; internal and external financial and economic relationships of the firm. I, II; 3. Prerequisite: Economics 102 and 103, or 108; Accountancy 105 or 201. VAN ARSDELL and others.

**255. Industrial Consolidation.** The development of industrial concentration; the financing of complex corporate enterprises; the problems of the independent, competitive business enterprise; the development of public policy relating to monopoly, industrial cooperation, and competition. I, II; 3. Prerequisite: Economics 254. BROWN.

**257. Corporation Finance.** A study of the character of corporations; corporate securities; acquiring capital; internal financial control; expansion and intercorporate relations; and corporate capital readjustments. For non-commerce students only. I, II; 3. Prerequisite: Economics 102 and 103, or 108. OSBORN.

**258. Financial Institutions—Functions and Practices.** A study of the development and the practices of specialized financial institutions in the United States, commercial banking, central banking, savings banks, trust companies, investment banking, real estate finance, agricultural finance, government financial institutions. I; 3. Prerequisite: Economics 102 and 103, or 108. NOLEN.

**259. Investments.** Nature of investment policy; types, analysis, and evaluation of investment opportunities; investment procedure. I, II; 3. Prerequisite: Economics 254. MAYER.

**260. Economics of Insurance.** A survey course in the field of insurance to serve as a common introductory course to the fire, marine, casualty, surety, and life branches of the insurance business. I, II; 3. Prerequisite: Economics 102 and 103, or 108. MEHR and others.

**262. Life Insurance.** A study of the life insurance industry, companies, products, and markets. I, II; 3. Prerequisite: Economics 102 and 103, or 108. CAMMACK and others.

**263. Property Insurance.** The study of hazards, policies, rates, underwriting, and loss-adjustment problems connected with fire insurance, extended coverage, consequential property damage, ocean marine and inland marine losses. II; 3. Prerequisite: Economics 260. HEDGES.

**271. Business Statistics.** Analysis of business data through use of statistical methods. Normal curve and sampling, variance analysis, special purpose index numbers,

curvilinear trend analysis, multiple and partial correlation, with reference to specific business problems. I, II; 3. Prerequisite: Economics 103 and 170. HAWORTH.

280. **Economics of Public Utilities.** Economic characteristics of utilities industries; special problems of production, utilization, price, finance, management, control, regulation; public and cooperative ownership; federal power policy. II; 3. Prerequisite: Economics 102 and 103, or 108. GRAY.

287. **Industrial Traffic Management.** A course designed especially for those who will come into contact with transportation as shippers or receivers of freight. Includes use of freight classifications, tariff interpretation, rights and duties of shippers and carriers. II; 3. Prerequisite: Economics 384. LOCKLIN.

288. **Government Regulation of Economic Activity.** Analysis of the economic bases, policies, and consequences of government regulation over economic activity. Economic patterns of regulation are studied in selected areas. I, II; 3. Prerequisite: Economics 102 and 103, or 108. STEINER.

290. **Honors.** Senior candidates for graduation with honors or high honors should elect one or the other of the following options: Option A—an acceptable thesis in economics. Option B—a comprehensive examination, six hours in length, covering a review of economics. I; 2 to 4. BROWN.

291. **Honors.** Senior candidates for graduation with honors or high honors should elect one or the other of the following options: Option A—an acceptable thesis in economics. Option B—a comprehensive examination, six hours in length, covering a review of economics. II; 2 to 4. BROWN.

292. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. I; 3 to 5. BROWN.

293. **Independent Study.** Seniors registered in the College of Commerce and Business Administration who were awarded class or college honors in their junior year may do independent study for a total of not more than ten semester hours in this department or sixteen semester hours if divided between this and any other department. II; 3 to 5. BROWN.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

300. **Intermediate Economic Theory and Analysis.** A development of the leading theories and analyses of value and distribution. Problems and policies of price determination of both the firm and the industry and factor pricing are presented at the intermediate level of analysis. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102, 103 or 108, 109. BELL.

301. **Monetary and Employment Theory.** Monetary theory including various versions of the quantity theory of money; the modern theory of the determination of the level of income and employment; theories of money and interest; fiscal and monetary policy; criteria, proposals, critique. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 250. MCEVOY.

306. **History of Economic Thought.** A study of the development of economics. Contributions of schools of thought and individual writers are examined as they influenced economic thought and national policy. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; senior standing. BELL.

312. **Economics of Welfare.** Review of the marginal conditions for maximum welfare. Analysis of the consequences for welfare of economic security, freedom, consumption standards, unemployment, inequality of income distribution, social costs in production, etc. Various philosophies relating to welfare will be examined. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108. MCCONNELL.

**26. Theories and Policies of International Commerce.** Analysis of international trade theories, classical and recent; international commercial policies, past and current; economic development in selected world regions; international commercial agreements and conferences; foreign trade policy of the United States. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108 and 109. BECKETT.

**28. Latin-American Economic Problems.** Economic problems of commerce, finance, transportation, mining, agriculture, and industry in Latin America; Latin-American and international economic relationships. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. BECKETT.

**36. American Economic History.** Westward movement: growth of industry, agriculture, commerce, finance, transportation, trust movement, and labor. I, II; 3 hours, or ½ to 1 unit. KEMMERER.

**42. Economics of Social Security.** Same as Labor and Industrial Relations 342. A critical analysis of the economic issues and problems involved in our legislative efforts to reduce the economic risks of unemployment, old age dependency, and industrial injury. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. MCNATT.

**43. The Labor Market.** Same as Labor and Industrial Relations 343. Economic analysis of the labor market, its structure, characteristics, and operations in contrast with other markets; factors making for equilibrium and disequilibrium; migration; occupational and industrial mobility; labor market research including techniques and materials. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108, and 240. PARRISH.

**44. The Law and Labor.** Same as Labor and Industrial Relations 344. An economic analysis of the problems and issues arising out of the legislative and judicial efforts to define the rights, duties, and responsibilities of labor organizations and management in the field of industrial relations. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; Economics 240. MCNATT.

**46. Foreign Labor Movements.** Same as Labor and Industrial Relations 346. Analysis of the history, organization, economic policies, political programs, and domestic, international, and contemporary influence of the labor movements of Great Britain, Sweden, Germany, France, Latin America, and Russia. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 240.

**63. Advanced Life Insurance.** A study of the application of life insurance to the problems of family security, business security, investments, and estate protection. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 262. MEHR.

**66. Casualty Insurance.** An examination of hazards, contracts, forms, rates, underwriting principles, and loss prevention activities in the following branches of insurance: workmen's compensation, automobile, public liability, burglary, robbery, theft, glass, power plant, credit, accident and health, and fidelity and surety. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 260. MEHR.

**67. Problems in Insurance.** An analysis of problems dealing with the fitting of insurance coverages to the needs of business. The course considers the problems of surveying hazards, selecting policy forms, rating, underwriting, loss adjustment, loss prevention, and over-all insurance planning. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 263 and 366; senior standing. MEHR.

**70. Applied Statistical Analysis.** A general course in statistical methods applied to the subject matter fields of the College of Commerce and Business Administration; intended principally for those students who have entered or intend to enter a program of graduate study and whose training in the basic statistical methods employed in these disciplines is inadequate. I; 4 hours, or 1 unit. Prerequisite: Admission to candidacy for a graduate degree with no more than one course in economic statistics; or, in case of undergraduates, thirty hours of commerce subjects. Credit will not be allowed for this course in addition to that for Economics 271. NEISWANGER.

371. **Applied Problems in Sampling.** Design of various types of samples useful in economics and business research; cost limitations and the design of samples; sources of bias and sampling methods; interpretation of the results. I, II; 3 hours, or ½ to 1 unit. Prerequisite: One course in mathematics; Economics 170 or a similar introductory course in statistics. SARTORIUS.

372. **Index Numbers.** The theoretical formulation of index numbers and the statistical problems of estimation and measurement for index numbers of price, production, productivity, cost of living, level of living, and preference scales. II; 2 hours, or ½ unit. Prerequisite: Economics 170; Economics 102 and 103, or 108.

373. **Correlations in Business and Economic Data.** A study of the measurement of relationships among economic and business data. Methods for expressing these relationships (correlation, analysis of variance, chi-square) will be studied by examining specific problems in which these techniques have proved to be useful. The use of critical attitudes in the use of statistical tools will be emphasized throughout the course. II; 2 hours, or ½ unit. Prerequisite: Economics 170, 171, or 271, or equivalent. PADEN.

374. **Business Fluctuations and Forecasting.** Analysis of the types of variation in individual industry series and the economy as a whole; use of various indicators of economic conditions. II; 3. Prerequisite: Economics 170 and 250. PADEN.

375. **The National Income and Its Distribution.** The statistical aspects of estimating the national income and its distribution and of analyzing the interrelationships in national income and related series. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; a first course in statistics.

376. **Statistics of Labor.** A study of the methods and problems involved in the derivation of "labor statistics" from both the theoretical and practical points of view. The statistical aspects of the measurement, analysis, and interpretation of data on wages, employment, labor force, and productivity will be stressed. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 170 or equivalent.

377. **Senior Seminar in Statistics.** The work in the course will deal with statistical problems of general interest in economics and business. The topics will be selected to emphasize difficulties of definition, concept, data collection, measurement, and analysis and will serve to bring together the theoretical concepts and methodological tools which have been acquired by the student in preparatory courses. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 170 and 271; credit or registration in Economics 371 (or 372 and 373). NEISWANGER and others.

378. **Consumers and the Market.** Market forces affecting the quantity, quality, and price of consumer goods and consumers' ability to choose wisely, with special attention to retailing, monopolistic competition, advertising, the provision of information to consumer and important controls relating to these. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. REID.

380. **Economic Problems of the Family.** Economic functions and problems of the family; important changes, household production, earning the family income, its adequacy and security, the family standard of living, spending and saving, and problems of financial management. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. REID.

384. **Economics of Transportation.** Economic aspects of the transportation industry with special emphasis on problems of regulation and public policy. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. HARBESON, LOCKLIN.

385. **Economic Problems of Commercial Air Transport.** Study of air transport with particular reference to questions of public policy, system of regulation, and regulatory policy. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. LOCKLIN.

386. **Current Transportation Problems.** An analytical and critical study of selected problems of current interest in transportation. II; 3. Prerequisite: Economics 384. HARBESON.

**388. Economics of National Security.** Analysis of economic aspects of American national security in relation to world problems, economic problems of mobilization, and the impact of national security policies on the economy. Includes problems and policies in the area of industrial production, economic stabilization, manpower allocation, agriculture, foreign economic warfare, military procurement, and facility expansion. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108.

**389. Public Policy Relating to Competition and Monopoly.** The organization and tactics of market control, the development of antitrust law and policy, public policy regarding competitive practices, special policies applying to natural resource industries, and regulated monopoly and government ownership as alternatives to the antitrust approach. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. HARBESON.

**390. Economics of Communications I.** Same as Journalism 390. Economic problems associated with the public means of communication: telephone, telegraph, the postal service, the various forms of radio broadcasting including FM, television, and facsimile, and the use of radio for the safety and efficiency of transportation, protective services, etc. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

**391. Economics of Communications II.** Same as Journalism 391. Economic problems associated with the following means of communication: motion pictures, newspapers, magazines, and books. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

## EDUCATION

**(Including Agricultural Education and Industrial Education)**

*Professors:* W. B. SPALDING (Dean of the College of Education), A. W. ANDERSON, K. D. BENNE, T. E. BENNER, G. M. BLAIR, R. B. BROWNE, R. W. BURNETT, A. W. CLEVENGER, F. G. CORNELL, L. J. CRONBACH, J. J. DEBOER, C. P. DEYOE, A. F. DODGE (Emeritus), E. W. DOLCH, F. H. FINCH, C. R. GRIFFITH, H. M. HAMLIN, H. C. HAND, K. B. HENDERSON, W. V. KAULFERS, S. A. KIRK, A. B. MAYS, P. V. MILLER, W. S. MONROE (Emeritus), C. W. ODELL, E. F. POTTHOFF, E. H. REEDER, C. W. SANFORD, J. H. SHORES, R. H. SIMPSON, B. O. SMITH, D. W. SNADER, C. B. STENDLER, J. L. TRUMP, LETITIA WALSH.

*Associate Professors:* C. M. ALLEN, L. B. FISHER, N. L. GAGE, W. E. HARNISH, J. T. HASTINGS, J. N. HOOK, M. K. HUMBLE, M. R. KARNES, C. G. KNAPP, W. E. MARTIN, LIESETTE MCHARRY, W. P. MCLURE, T. E. NEWLAND, A. W. NOLAN (Emeritus), M. M. OHLSEN, G. W. REAGAN, H. A. SCHULTZ, W. O. STANLEY, M. R. SUMPTION, H. D. TRIMBLE, VELMA WILSON, H. S. ZIM.

*Assistant Professors:* G. F. ANDERSON, D. P. AUSUBEL, F. P. BARNES, W. W. CHARTERS, R. N. EVANS, ALICE FEDDER, G. C. FINLAY, L. E. GILES, MABEL HAGAN, C. R. HILL, M. HORWITZ, ANN JEWETT, NELL JOHNSTONE (Emerita), R. S. JONES, G. C. KETTELKAMP, A. H. KREBS, W. KUHN, W. M. LIFTON, F. MCMURRAY, L. E. METCALF, J. T. MOORE, W. J. MOORE, L. J. PHIPPS, R. E. PINGRY, R. E. SCHULTZ, G. W. SOWARDS, J. N. WEISS, E. M. WOODMAN.

*Associate:* H. H. BRAUCHER (Emeritus).

*Instructors:* CATHERINE D. ADAMS, M. BEBERMAN, K. BURNS, PAULINE E. CHANGNON, MARGARET DEES, N. E. DILLEY, ANITA DOWLER, BEULAH DROM, JEAN E. FAIR, G. FIELDER, R. P. FRAZIER, E. W. GOESSLING, VIOLA GRIBANOVSKY, J. W. HANSON, D. J. INABNIT, C. E. JOHNSON, WILMA L. JOHNSON, GLADYS JONES, ELOISE M. KENNEDY, COLLEEN J. KIRK, D. R. KRATHWOHL, J. L. LANDES, A. M. LASHBROOK, I. LAZAR, AUDREY LINDSEY, L. E. MCCLEARY, DORIS L. MELLON, R. MILLER, L. L. PATHEAL, L. V. PETERSON, R. E. POTTER, O. W. RENFROW, E. I. RUBENDALL, H. C. RUDMAN, W. H. SCHUETZ, M. J. SCOTT, R. F. SEAMAN, ELIZABETH J. SIMPSON, W. R. SLOTHOWER, L. J. SMITH, R. W. STROW, W. L. WINNETT, METTA ZAHORSKY.

*Assistants:* G. Z. BARNETT, C. H. BAUMGARDNER, J. J. BLINDT, R. K. BROWN, G. M. DELLA PIANA, K. W. DICKMAN, L. E. DODSON, E. E. EASON, J. EDELEN, H. D. EVANS,

R. V. Exline, Jessie Fujita, T. W. Gandy, J. W. Gillis, L. G. Grebner, P. B. Hale, Ruby M. Holden, R. H. Holtzman, G. B. James, Charlotte Keck, J. Konya, R. P. Kropp, Geraldine LaRocque, J. J. Laska, C. M. Lindvall, W. R. McConnell, W. D. McNeill, B. Mehl, E. M. Moll, R. B. Mudge, M. C. Oelke, W. R. Oldham, O. E. Pittenger, D. M. Prince, W. Ray, Meriam Rosen, Ann Rovelstad, J. L. Saupe, Sicily A. Smedsvik, W. J. Spolar, J. E. Stone, E. C. Swadley, W. H. Vandevender, L. Walter, A. Ward, Lois Weaver, B. J. Young.

### COURSES FOR UNDERGRADUATES

**101. Nature of the Teaching Profession: An Orientation Course.** This course is designed to help the student get answers to the questions: "What does education in its various branches have to offer?" and "What preparation in general education, subject matter fields, and professional education is required or desirable?" Through an extensive testing and counseling program this course is designed to help the student evaluate his potentialities and problems with reference to becoming a teacher. I, II; 2. Finlay, Hand.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Foundations of American Education.** A study of contemporary American public education in the setting of current American culture. Confusions and issues with respect to the school program, its purposes, its content, its methods, and its organization are related to confusions and issues with respect to social, economic, and political purposes and organizations, both domestic and international. An attempt is made through the study of these relationships to clarify the contemporary social functions of the American school and teaching profession. I, II; 2. Prerequisite: Psychology 100; Education 101. Smith, Stanley.

**211. Educational Psychology.** The basic undergraduate course in psychology of education for prospective teachers. Materials and principles from the various areas of psychology (mental hygiene, psychology of learning, etc.) are applied to the practical problems of teaching. I, II; 3. Prerequisite: Psychology 100. Blair, Dolch, Inabnit, Jones, Simpson, Woodman.

**218. Remedial Reading in the Elementary School.** I; 3. Prerequisite: Education 211. Dolch.

**219. Remedial Reading in the High School.** II; 3. Prerequisite: Education 211. Dolch.

**220. Educational Practice in the Education of Exceptional Children.** A course in practice teaching providing teaching experience with exceptional children. I, II; 2 to 5. Prerequisite: Senior standing; consent of department; sufficient hours of background courses. Kirk and others.

**230. Principles of Elementary Education.** Application of general considerations of the role of American public education in current American culture to elementary education. Attention is given to basic principles underlying the selection of aims, content, programs, and methods for elementary schools. I, II; 2. Prerequisite: Education 101; registration in Education 201. Barnes, Shores, Sowards.

**231. Technic of Teaching in the Elementary School.** I, II; 3. Prerequisite: Education 100, 211, and 230; registration in Education 220 or 232. Barnes, Shores.

**232. Educational Practice in Elementary Education.** A course in practice teaching to meet certification requirements for teaching in the elementary school. I, II; 2 to 5. Prerequisite: Education 230; senior standing. Barnes and others.

**233. Development of Teaching Units in the Elementary School.** Techniques for the development of teaching units as a method of improvement of instruction in the elementary school. I, II; 2. J. T. Moore, Sowards.

234. **Science in the Elementary School.** The role of science in the elementary school and in the lives of children. Experiences, techniques, and organization of science content in primary, intermediate, and upper grades. No science background is assumed and no attempt is made to cover content. Opportunity for laboratory and field experiences and demonstrations of materials of value in science teaching. I, II; 3. ZIM.

235. **Teaching Social Studies in the Elementary School.** A course to help prospective elementary teachers to develop concepts with reference to the function of the elementary school in the development of social ideas and ideals with children. Special consideration is given to the social studies as the core of the elementary school curriculum. I, II; 3. Prerequisite: Education 101; junior standing. REEDER, SOWARDS.

236. **Child Development for Elementary Teachers.** A study of child growth and development designed particularly for those preparing to teach in the elementary school. Special emphasis given to the significance of the developmental process for educational programs and procedures. Systematic experience in studying and evaluating children's behavior and in handling children. I, II; 3. Prerequisite: Psychology 100. LAZAR, MARTIN.

237. **Child Development for Elementary Teachers.** Continuation of Education 236. I, II; 3. Prerequisite: Education 236. LAZAR, MARTIN.

240. **Principles of Secondary Education.** Designed to provide each specialized educational worker with a common orientation as to the major responsibilities of the public school as a unit and his own specialized responsibilities and problems within the framework of the total educational enterprise. Sections in this course will, insofar as possible, be organized according to the student's teaching major. I, II; 2. Prerequisite: Psychology 100; Education 101. BURNETT, DEBOER, FINLAY, HAND, HENDERSON, KAULFERS, KREBS, METCALF, SNADER.

241. **Technic of Teaching in the Secondary School.** Methods of instruction. I, II; 3. Prerequisite: Education 240; registration in Education 242. STAFF.

242. **Educational Practice in Secondary Education.** A course in practice teaching to meet certification requirements for teaching in secondary schools. Application for a practice teaching assignment must be made in February of the year prior to the academic year assignment is desired. I, II; 2 to 5. Prerequisite: Education 240; senior standing. STAFF.

247. **Teaching of Speech.** Same as Speech 247. A study of methods and materials used in teaching speech in the high school. I, II; 5. Prerequisite: Senior standing; 3.5 grade average. BURNS.

250. **Community Experiences in Home Economics Education.** Supervised experiences preparing for a successful student teaching experience and for beginning work as a teacher of homemaking. Methods of studying the community: making home visits; supervising home experiences; preparing for the opening of school; planning department facilities; cooperative planning for the homemaking program; advising school-sponsored organizations; counseling students; keeping records and making reports. S; 2. WALSH and others.

291. **Thesis.** I; 2. Prerequisite: Senior standing. SPALDING and others.

292. **Thesis.** II; 2. Prerequisite: Senior standing. SPALDING and others.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

300. **The History of Education.** Brief, introductory summary of ancient and medieval education followed by a more extended study of educational developments since the Italian Renaissance. Special emphasis placed on the relation of educational trends to broader social, economic, political, and intellectual movements. I, II; 3 hours, or ½ unit. ANDERSON.

301. **Philosophy of Education.** Based on a careful and critical reading of selected chapters from John Dewey's *Democracy and Education.* Designed to develop competencies

in (1) locating and criticizing basic assumptions of an educational argument, (2) examining and criticizing basic assumptions about educational purposes and practices, and (3) examining and testing systematic relationships between educational ideas and assumptions, etc. I, II; 2 hours, or ½ unit. BENNE, MCMURRAY, SMITH, STANLEY.

**302. History of American Education.** The development of theory and practice in American education in relation to political, social, and cultural developments. I, II; 2 hours, or ½ unit. ANDERSON.

**303. Comparative Education.** General foundations course designed to contribute to professional competence in dealing with those educational problems requiring an understanding of the relationship of education to a particular society. A study of selected national systems of education in their differing cultural settings. I, II; 2 hours, or ½ unit. KAULFERS.

**304. Social Foundations of Education.** An introductory survey of the interrelationship between school and society and of the impact on public education of the major social trends and forces operating in our society. Designed to develop competencies in (1) understanding of the role of the culture in shaping both human personality and social institutions, (2) evaluating the effects of the various welfare and class levels in the United States on the lives of children and adults and on the work of the school, and (3) understanding major elements operating in the social crisis of our time and the impact of these elements on education. I, II; 2 hours, or ½ unit. BENNE, STANLEY.

**311. Psychology of Learning for Teachers.** A consideration of learning situations in the light of psychological findings and concepts. Development of a theory of learning, and its application to the teaching of attitudes, skills, and understandings. I, II; 3 hours, or ½ unit. Prerequisite: Education 211, and practice teaching or teaching experience. BLAIR, CRONBACH, JONES, POTTHOFF, SIMPSON, WOODMAN.

**312. Mental Hygiene and the School.** A consideration of social and emotional adjustment. Study of normal personality, integration, feelings of inferiority, adjustment mechanisms, classroom therapy, behavior disorders in children, and introduction to methods of child study and provision for emotionally disturbed children. I, II; 2 hours, or ½ unit. Prerequisite: Education 211, and practice teaching or teaching experience. AUSUBEL, BLAIR, HORWITZ, JONES, POTTHOFF, SIMPSON, WOODMAN.

**315. Sociology of Education.** Same as Sociology 315. Objective comparative study of education as a social process in various cultures and historical periods, with main emphasis on present education in countries which share Western civilization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100. SHIDELER.

**317. Exceptional Children.** An introduction to the study of children who deviate from the average in mental, physical, and social characteristics. The course includes a study of the characteristics of such children and the adaptation of educational procedures to their abilities and disabilities. I, II; 3 hours, or ½ unit. Prerequisite: Psychology 100. KIRK, NEWLAND.

**318. Workshop and Laboratory in Education of Exceptional Children.** Observation of special laboratory classes of various types of exceptional children; group discussions; conferences with specialists as consultants; work on a project of particular concern to the individual student. S; 4 hours, or 1 unit for four weeks; 8 hours, or 2 units for eight weeks. Prerequisite: Senior standing.

**319. Special Education of the Deaf.** Survey of the curriculum and techniques in preschools, kindergartens, and primary and intermediate levels as applied to the hard-of-hearing, deafened, and deaf child. A study of sense training, lip reading, vocabulary development, reading techniques, language and speech development, auditory training, and curriculum construction. I; 5 hours, or 1 to 1½ units. Prerequisite: First three years of curriculum for teachers of the deaf, or equivalent.

**320. Special Education of the Deaf.** Continuation of Education 319. II; 5 hours, or 1 to 2 units. Prerequisite: Education 319.

**321. Care and Education of Orthopedically Handicapped Children.** Survey of orthopedic handicaps in children, psychological and social effects of such handicaps, and the kinds of schools and services provided for the education of the various types of crippled children. The education of the cerebral palsied child is emphasized. S; 4 hours, or 1 unit. Prerequisite: A teacher's certificate, or senior standing, or a major in some area of special education.

**322. Psychology and Education of the Mentally Handicapped.** A study of the social, emotional, physical, and learning characteristics of mentally handicapped children; methods of diagnosis and differentiation; educational organization and teaching techniques employed for their rehabilitation. I; 3 hours, or ½ unit. Prerequisite: Education 231; senior standing. KIRK.

**323. Psychology and Education of the Mentally Handicapped.** Continuation of Education 322, with emphasis on curriculum. II; 3 hours, or ½ unit. Prerequisite: Education 322. KIRK.

**324. Mental and Educational Measurement of Exceptional Children.** Designed to develop an understanding of and ability to interpret the results of psychological and educational tests. Practice is provided in test administration, with emphasis on diagnosis and problems encountered in testing acoustically handicapped, orthopedically handicapped, visually handicapped, mentally handicapped, and defective of speech. I, II; 3 hours, or ½ unit. Prerequisite: Education 317, or consent of instructor. KIRK, NEWLAND.

**336. Primary Reading.** Critical evaluation of current schools of thought with regard to the teaching of reading and an analysis of the concept of learning as well as the meaning of reading upon which each school is based. Attention is given to reading as a part of the total growth process of the child and to knowledge of methods and materials used in teaching beginning reading. I, II; 3 hours, or ½ unit. Prerequisite: Education 101, 201, and 230. J. T. MOORE.

**337. Art Education in the Elementary School.** Methods, plans, and materials for teaching art as an integral part of the total educational program in the elementary school. I, II; 3 hours, or ½ unit. Prerequisite: Education 101, 201, and 230. J. T. MOORE, SCHULTZ.

**354. Audio-Visual Materials and Problems.** Audio-visual materials will be examined from the point of view of their effectiveness and possible utilization in the school program. Recent investigations on materials and methods of presentation will be studied to ascertain their pedagogical implications. The technical and administrative problems of integrating audio-visuals into the school curriculum are considered. I, II; 3 hours, or ½ unit. Prerequisite: Education 211, 231, or 241; senior standing. PETERSON.

**370. Agricultural Education for First-Year Teachers.** Specific help with the problems of beginning teachers. Campus meetings in August and November. Other meetings in centers in the state convenient to first-year teachers. Visits by instructor to schools in which first-year teachers are employed. I; 3 hours, or ½ unit. Prerequisite: Education 276 and 277. PHIPPS.

**381. Principles of Vocational Education.** Study of basic concepts and practices of modern vocational education. I; 3 hours, or 1 unit.

**382. Organization and Administration of the Cooperative Part-time Program.** Same as Industrial Education 382. This course is designed to provide the specific professional training required of teachers and coordinators who are to conduct programs of diversified occupations in the secondary schools. II; 3 hours, or ½ to 1 unit.

**383. Problems of Industrial Education.** A survey of the problems and practices of the several phases of industrial education. II; 3 hours, or 1 unit.

**385. Principles of Vocational Guidance.** Basic concepts and practices of vocational guidance in public schools. What the teachers can do in vocational guidance. I; 3 hours, or 1 unit.

**390. Elements of Educational Statistics.** Designed for terminal value for professiona training of students not intending to pursue advanced graduate work, and for introductory value for students continuing graduate study in education. The course includes descriptive statistics, the nature of measurement in education, introduction to regression, correlation analysis, statistical inference, and the presentation and interpretation of statistical data in educational literature. I, II; 3 hours, or 1 unit. ODELL.

**391. Introduction to Evaluation.** This course is designed to serve two chief purposes: introduction to the broad field of evaluation, particularly its relation to curriculum development, and training in constructing tests in school subjects. It gives brief attention to intelligence, personality, and other measurement; types of scores; marking systems; selecting standard tests; testing programs; uses of results of measurement I, II; 3 hours, or 1 unit. HASTINGS, ODELL, SIMPSON.

## Agricultural Education

### COURSES FOR ADVANCED UNDERGRADUATES

**275. Summer Practice in Agricultural Education.** Supervised experience in the work of a teacher in vocational agriculture during a two-weeks period in the summer; planning summer work, teaching adult classes, supervising the farm practice of high school and adult students, advising school-sponsored organizations, counseling students, studying a community, providing facilities for agricultural education, becoming familiar with situations in which the student will later do six weeks of student teaching during a school year. S; 2. WEISS, PHIPPS.

**276. Practice in Agricultural Education.** Supervised experience in the work of a teacher of vocational agriculture during a six-week period; planning programs of agricultural education; teaching high school, young farmer, and adult farmer classes; providing facilities; evaluating outcomes; supervising practice; advising school-sponsored organizations; counseling students; keeping records and making reports. I, II; 5. Prerequisite: Education 201, 211, and 240; registration in Agricultural Education 277. DEYOE, KREBS, PHIPPS, WEISS.

**277. Programs and Procedures in Agricultural Education.** Preparation for a successful experience in practice teaching and for beginning work as a teacher of vocational agriculture. Procedures in planning a community program of agricultural education, teaching high school, young farmer, and adult farmer classes; providing facilities evaluating outcomes; supervising practice; advising school-sponsored organizations, counseling students; keeping records and making reports. I, II; 5. Prerequisite: Education 201, 211, and 240; registration in Agricultural Education 277. PHIPPS, WEISS

## Industrial Education

### COURSES FOR UNDERGRADUATES

**181. Industrial Arts.** Beginning course in woodwork problems of shopwork in wood and related technical material for shop teachers. I, II; 4. HUMBLE.

**182. Advanced Course in Woodwork.** Advanced course in design and construction of woodwork projects with related technical information. I, II; 4. Prerequisite: Industrial Education 181. HUMBLE, KARNES.

**183. General Metal Work.** A basic course in general metal work. Materials, tools, problems, and processes in bench metal work, foundry, introductory gas and arc welding I; 4. KARNES.

**184. Sheet Metal Work.** A basic course in sheet metal work. A study of the tools, materials, and processes involved in sheet metal work. Includes principles and techniques of sheet metal pattern development and layout and hand and machine operations. I; 2. Prerequisite: Industrial Education 183. KARNES.

### COURSES FOR ADVANCED UNDERGRADUATES

**283. Ornamental Iron and Art Metal for Teachers.** Design and construction of useful projects involving the basic manual and machine skills in the area of ornamental iron and art metal. Experiences in selecting, designing, and construction of tools and equipment and the preparation of instructional materials for teaching this phase of metal work in elementary and secondary schools. II; 2. Prerequisite: Industrial Education 183, or consent of instructor. KARNES.

**284. Advanced Metal Work.** Intermediate and advanced operations with hand and machine tools. The designing, planning, and construction of machine shop projects. A study of ferrous and nonferrous materials appropriate for machine shop work. II; 4. Prerequisite: Industrial Education 183.

**285. General Electricity.** A basic course in introductory general electricity, theory, and shop practice. Principles of electricity applied to elementary shop problems in area of house wiring, communications, construction and repair of household appliances, fractional horse-power motors and generators. I; 3. Prerequisite: Industrial Education 183.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**381. Principles of Vocational Education.** Same as Education 381. Study of basic concepts and practices of modern vocational education. I; 3 hours, or 1 unit.

**382. Organization and Administration of the Cooperative Part-Time Program.** Same as Education 382. This course is designed to provide the specific professional training required of teachers and coordinators who are to conduct programs of diversified occupations in the secondary schools. II; 3 hours, or ½ to 1 unit.

**383. Problems of Industrial Education.** Same as Education 383. A survey of the problems and practices of the several phases of industrial education. II; 3 hours, or 1 unit.

**385. Principles of Vocational Guidance.** Same as Education 385. Basic concepts and practices of vocational guidance in public schools. What the teachers can do in vocational guidance. I; 3 hours, or 1 unit.

## ELECTRICAL ENGINEERING

*Professors:* J. D. RYDER (Head of Department), J. BARDEEN, W. L. EVERITT, M. A. FAUCETT, G. H. FETT, L. GOLDSTEIN, M. S. HELM, V. P. HESSLER, E. C. JORDAN, C. A. KEENER, A. R. KNIGHT, J. O. KRAEHENBUEHL, N. W. MCLACHLAN, E. B. PAINE (Emeritus), M. B. REED, E. A. REID, J. K. TUTHILL, J. T. TYKOCINER (Emeritus), H. M. VON FOERSTER.

*Associate Professors:* L. B. ARCHER, D. S. BABB, P. D. COLEMAN, P. R. EGBERT, W. L. EMERY, H. N. HAYWARD, J. W. HOFFMAN, H. W. HORN, W. E. MILLER, T. A. MURRELL, C. C. NASH, G. R. PEIRCE, P. F. SCHWARZLOSE, C. E. SKRODER, R. M. WAINWRIGHT, N. WAX, J. E. WILLIAMS.

*Assistant Professors:* W. G. ALBRIGHT, A. D. BAILEY, J. A. BARKSON, P. A. BAUMAN, L. R. BLOOM, W. H. BYERS, M. H. CROTHERS, E. F. DEMERS, C. E. DRUMHELLER, W. J. FRY, D. F. HANG, D. F. HOLSHOUSER, P. K. HUDSON, M. S. MCVAY, R. H. NAU, J. P. NEAL, H. D. WEBB, E. K. WEISE.

*Associates:* J. M. ANDERSON, W. H. CHRISTOFFERS, E. W. ERNST, J. E. ETTER, F. J. FRY, E. C. HAYDEN, T. R. O'MEARA, G. A. PETTICREW, D. ROYAL, K. TOMAN.

*Instructors:* L. O. BROWN, A. S. CHODAKOWSKI, C. L. COATES, M. GILDEN, C. V. JAKOWATZ, J. U. JEFFRIES, H. W. KATZ, I. KAUFMAN, H. E. KOENIG, G. D. MCMULLEN, B. SILVERMAN, S. W. TEHON, B. J. WILSON.

*Assistants:* M. L. Babcock, A. J. Barrett, W. A. Blackwell, R. E. Brown, K. R. Brunn, R. W. Burtness, T. N. Chin, G. L. Clark, F. Dunn, H. W. Farris, M. Fisher, V. J. Fowler, R. C. Hansen, S. D. Hathaway, N. Holonyak, L. L. Howard, R. F. Hyneman, C. T. A. Johnk, J. B. Kreer, G. Kvitek, W. E. Michel, I. D. Nehama, O. T. Purl, M. D. Sirkis, P. D. Smith, R. A. Torkildsen, D. Tucker, W. Welkowitz, J. Wong, N. Yaru.

### COURSES FOR UNDERGRADUATES

**114. Wiring and Illumination.** Fundamentals of commercial and industrial illumination and wiring practice. I, II; 3. Prerequisite: Sophomore standing, or consent of instructor.

**126. Electric Circuits and Fields.** Study of units and relations in electric and magnetic circuits and fields. Basic concepts of circuit parameters. I, II; 4. Prerequisite: Physics 103; Mathematics 132; credit or registration in Physics 104 and Mathematics 142.

### COURSES FOR ADVANCED UNDERGRADUATES

**202. Direct and Alternating Current Circuits and Machines.** Fundamental principles of electric circuits and machines. For students in aeronautical, construction and drainage option of agricultural, ceramic, civil, and metallurgical engineering. I, II; 2. Prerequisite: Physics 103 and 104; Mathematics 147 or 142; credit or registration in Electrical Engineering 203.

**203. Direct and Alternating Circuits and Machines Laboratory.** To accompany Electrical Engineering 202. I, II; 1. Prerequisite: Credit or registration in Electrical Engineering 202.

**204. Applications of Electrical Equipment.** Applications of electricity for industrial uses. For students in ceramic and metallurgical engineering. I, II; 2. Prerequisite: Electrical Engineering 202 and 203; credit or registration in Electrical Engineering 205.

**205. Electrical Equipment Laboratory.** To accompany Electrical Engineering 204, I, II; 1. Prerequisite: Credit or registration in Electrical Engineering 204.

**206. Direct and Alternating Current Circuits.** Fundamental electric and magnetic units; direct and alternating current circuit analysis; complex numbers and vector diagram solutions. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Physics 103 and 104; Mathematics 142 or 147; credit or registration in Electrical Engineering 307.

**207. Direct and Alternating Current Laboratory.** Circuits laboratory to accompany Electrical Engineering 306. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 306.

**208. Direct and Alternating Current Apparatus.** Generators and motors, transformers, rectifiers, and electronic devices. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 306 and 307; credit or registration in Electrical Engineering 309.

**209. Direct and Alternating Current Laboratory.** Machines laboratory to accompany Electrical Engineering 308. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 308.

**216. Transit Engineering.** The application of electricity to the transportation systems. I, II; 3. Prerequisite: Electrical Engineering 202, 306, or 320, and 203, 307, or 321. Tuthill and others.

**217. Electrical Measurements.** A survey of devices and methods of electrical measurements for students with a limited background in electrical engineering. I; 3. Prerequisite: Electrical Engineering 202 and 203.

**256. Methods and Problems in Communication Engineering I.** Application of higher mathematics to the solution of engineering problems in communication circuits and field theories. Solutions of non-linear electrical and magnetic systems. Designed as an

elective for students in electrical engineering, communications, and engineering physics. I; 3. Prerequisite: Mathematics 345; Electrical Engineering 340 and 341; consent of instructor.

**258. Methods and Problems in Communication Engineering II.** Applications of higher mathematics to the solution of engineering problems in communication circuits and problems in theories. Solutions of non-linear electrical and magnetic systems. Designed as an elective for students in electrical engineering, communications, and engineering physics. II; 3. Prerequisite: Electrical Engineering 256.

**260. Fundamentals of Illumination.** Fundamentals of illumination engineering design and practice. I, II; 3. Prerequisite: Electrical Engineering 126; Mathematics 142; Physics 104.

**268. Fundamentals of Illumination Engineering.** Fundamentals of sources, point and surface illumination and design. I, II; 2. Prerequisite: Senior standing in electrical engineering.

**271. Electrical Engineering Problems.** I, II; 1 to 3. Prerequisite: Approved written application to department.

**272. Electrical Engineering Problems.** I, II; 1 to 3. Prerequisite: Approved written application to department.

**288. Economic Aspects of Engineering.** Fundamental principles of engineering economy. I, II; 3. Prerequisite: Junior standing in electrical engineering; Electrical Engineering 320.

**290. Seminar.** Papers and discussions of current engineering topics. I, II; no credit. Prerequisite: Senior standing in electrical engineering.

**292. Seminar.** Papers and discussions of current engineering topics. I, II; 1. Prerequisite: Senior standing in electrical engineering.

**297. Thesis.** Preliminary reading and investigation. I; 0 to 3.

**298. Thesis.** Continuation of Electrical Engineering 297. Completion of thesis. II; 0 to 3.

**299. Inspection Trip.** I; no credit. Prerequisite: Senior standing in electrical engineering.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**320. Circuit Analysis.** Detailed and analytical solution of periodic current circuits; networks and network theorems; coupled circuits. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 126; Physics 104; credit or registration in Mathematics 341, 342, 343, or 345, and Electrical Engineering 321.

**321. Circuit Laboratory.** To accompany Electrical Engineering 320. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 320.

**322. Circuit Analysis.** Continuation of Electrical Engineering 320. Wave analysis; three-phase circuits; three-phase power and energy measurements; symmetrical components analysis; filters; transients. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 323.

**323. Circuit Laboratory.** To accompany Electrical Engineering 322. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322.

**327. Theory of Measurements.** Precise measurement of electrical quantities and the application of measurement theory to engineering problems. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322.

**330. Electrical Machinery.** Transformers and polyphase induction motors. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 322 and 323; credit or registration in Electrical Engineering 331.

331. **Electrical Machinery Laboratory.** To accompany Electrical Engineering 330. I, II 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 330.

332. **Electrical Machinery.** Synchronous machines, single-phase motors, direct-current machines, application. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 330 and 331; credit or registration in Electrical Engineering 333.

333. **Electrical Machinery Laboratory.** To accompany Electrical Engineering 332. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 332.

334. **Electrical Power Apparatus.** Single and three-phase transformers. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322 and 335.

335. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 334. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 334.

336. **Electrical Power Apparatus.** Synchronous and induction generators and motors. I, II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 334 and 335; credit or registration in Electrical Engineering 337.

337. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 336. I, II; 2 hours, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 336.

338. **Electrical Power Apparatus.** Direct-current generators and motors, converters, single-phase motors, frequency changers, duty cycles. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 335 and 336; credit or registration in Electrical Engineering 338.

339. **Electrical Power Apparatus Laboratory.** To accompany Electrical Engineering 338. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 338.

341. **Electronics.** High-vacuum electron tubes, emission, electron ballistics, tube characteristics, equivalent circuits, linear amplifier circuits and characteristics, gas tubes, photo-tubes. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 320 and 321.

347. **Industrial Electronics.** Feedback systems, rectifiers, amplifiers, controls, elements of design. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 340 and 341; credit or registration in Electrical Engineering 330 or 334.

349. **Electron Tube Circuits.** Linear and nonlinear amplifiers, fundamentals of modulation and detection, oscillators, rectifiers. I, II; 5 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322, 323, 340, and 341; credit or registration in Electrical Engineering 353.

351. **Networks and Lines.** Reactance networks, general transmission lines, equations, low-loss lines, reflections. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 320 and 321; credit or registration in Electrical Engineering 322.

353. **Radio Circuits.** Impedance transformation, reactance network synthesis as applied to radio frequencies; modulation theory; principles of receivers and transmitters. I, II 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322, 340, and 351; credit or registration in Electrical Engineering 349.

355. **Fields and Waves.** Theory of VHF and microwave generators; electromagnetic fields, radiation and propagation of electromagnetic energy, radiating systems. I, II; 4 hours or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

361. **Elements of Illuminating Engineering Design.** Application of the fundamentals of optics and light to developments in the design of illumination equipment and light

ing installations. I, II; 4 hours, or 0 to ½ unit. Prerequisite: Mathematics 132 and 142; Physics 104; Electrical Engineering 260.

**362. Principles of Illuminating Engineering.** Concept and units in light calculations; calculation of illumination from point, line, and surface sources; interpretation of photometric and test data. I, II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 120; credit or registration in Electrical Engineering 363; Mathematics 345; Physics 270.

**363. Illumination and Photometry Laboratory.** Photometry and illumination measurements. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 362.

**364. Illumination Design and Economics.** Design of lighting systems for natural and artificial illumination; applications for interiors and exteriors in both commercial and industrial installations; economic studies; design of reflectors and lighting equipment. II; 4 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 362 and 363; credit or registration in Electrical Engineering 365.

**365. Illumination Design Laboratory.** To accompany Electrical Engineering 364. Checking and constructing equipment and installation designs in lighting. II; 1 hour, or 0 to ¼ unit. Prerequisite: Credit or registration in Electrical Engineering 364.

**366. Illumination Sources.** Study of natural and artificial light sources covering combustion, incandescent, and gaseous lamps with emphasis on fundamental laws; radiation measurements and colorimetry. II; 3 hours, or 0 to ½ unit. Prerequisite: Credit or registration in Electrical Engineering 364 and 365.

**374. Electrical Energy Measurements, System Protection.** Transmission equipment, energy meters, protective relays. I, II; 3 hours, or 0 to ¾ unit. Prerequisite: Registration in Electrical Engineering 334 and 375, or consent of instructor.

**375. Energy Measurement and Protection Laboratory.** To accompany Electrical Engineering 374. I, II; 1 hour, or 0 to ¼ unit. Prerequisite: Registration in Electrical Engineering 374.

**376. Power Circuit Analysis.** Advanced analysis of circuits used for power transmission and distribution. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 322 and 323.

**377. Machine Application and Control.** Analysis of electrical machinery applications; controls. II; 3 or 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 336 and 337; credit or registration in Electrical Engineering 338.

**378. Fundamentals of Power Transmission Engineering.** Fundamentals of electrical and mechanical design of power transmission systems. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Credit or registration in Electrical Engineering 334 and 335.

**379. Power Transmission.** Advanced analysis of electric power transmission systems, faults, stability. II; 3 hours, or 0 to ¾ unit. Prerequisite: Electrical Engineering 336, 377, and 378.

**381. Pulse Techniques.** Response of electrical systems to repeated transients. I, II; 4 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

**386. Fundamentals of Servomechanisms.** Fundamental knowledge required in the analysis of servomechanisms and automatic control devices. II; 4 hours, or 0 to 1 unit. Prerequisite: Senior standing in electrical engineering, or consent of instructor.

**387. Electrical Design.** Fundamental principles of electrical power apparatus design with particular application to transformers and generators. Properties of materials in common use; construction of coils; magnetic attraction; stored energy, field mapping; heat dissipation; temperature rise and rating of apparatus. For students selecting the option in power. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 330 and 331, 334 and 335.

389. **Communication Design.** Design, construction, and complete test of a radio transmitter or receiver. I, II; 3 hours, or 0 to 1 unit. Prerequisite: Electrical Engineering 349 and 353.

## ENGINEERING

*Professors:* J. O. Draffin, H. H. Jordan (in charge), L. A. Rose.
*Associate Professors:* G. W. Harper, W. W. Hay, E. F. Heater, L. C. Pigage.
*Instructor:* P. E. Peterson.

### COURSES FOR UNDERGRADUATES

140. **Transportation.** Transportation systems; history and technical development of pipe lines, rail, highway, waterway, and air transport; organization and interrelation. I; 2. Prerequisite: Sophomore standing. Hay.

141. **Transportation.** Continuation of Engineering 140. Regulation of transportation systems: technical, operating, financial, governmental; government versus private ownership and operation; technical and economic problems of transport systems; labor personnel and management problems; history and technical development of city transit systems. II; 3. Prerequisite: Sophomore standing. Hay.

### COURSES FOR ADVANCED UNDERGRADUATES

216. **Engineering Reports.** Study and practice in the preparation of the main types of reports called for in engineering practice. I, II; 3. Prerequisite: An elective for seniors; juniors admitted with consent of instructor. Heater, Rose.

220. **History of Engineering.** Study of the important elements in the growth of the art and science of engineering from ancient times to the present; lives of some of the men who have been leaders; effect of engineering on the social conditions of the various periods. I, II; 2. Prerequisite: Junior standing. Draffin.

230. **Labor Relations.** The individual and his coordination, orientation, and maintenance in the group and in the business organization. The service, functions, regulations, union aspects, wage-price structure, and public considerations affecting labor-management relationships in various organizations. I, II; 3. Prerequisite: Junior standing in engineering, or consent of instructor. Pigage.

239. **Industrial Development and Supervision.** Technological influences in the development of modern industry; care, inspection, and maintenance of plant, equipment, raw materials, and products; reduction of costs; safety and health of workers; accident and fire prevention; engineering reports and job analysis; responsibilities of supervisors. I, II; 3. Prerequisite: Junior standing. Harper.

292. **Engineering Law.** Contracts, evidence, torts, equity, real property, corporations, agency, sales, negotiable instruments, water rights, patent rights, special assessments, contract letting, general conditions. I, II; 3. Prerequisite: Senior standing in engineering or architecture. Peterson.

## ENGLISH

**(Including English Literature, American Literature, Rhetoric and Composition, and Business English)**

*Professors:* G. N. Ray (Head of Department), C. R. Anderson, T. W. Baldwin, E. Bernbaum (Emeritus), J. T. Flanagan, H. F. Fletcher, G. T. Flom (Emeritus), R. A. Gettmann, M. T. Herrick, H. N. Hillebrand (on leave), P. N. Landis, H. Larsen, J. J. Parry, C. W. Roberts, A. W. Secord, R. M. Smith.

*Associate Professors:* E. H. Davidson, G. B. Evans, M. S. Goldman, J. N. Hook, B. A. Milligan, R. W. Rogers, C. H. Shattuck, Leah F. Trelease, R. B. Weirick.
*Assistant Professors:* Garreta H. Busey, J. J. Campbell, Margaret French, G. P. Haskell, A. G. Holaday, Cornelia P. Kelley, Ruth Kelso, E. G. Mathews, Esther H. Rapp, Clarissa Rinaker (on leave), G. Scouffas, G. B. Stillwell, F. H. Townsend, Caroline F. Tupper (Emerita), L. C. Warren, F. W. Weeks.
*Instructors:* Helen Beveridge, Margaret Bloom, W. J. Chamberlin, N. P. Davis, J. A. Hamilton, B. Harkness, J. T. Maguire, Constance Nicholas, J. K. Quinn, H. F. Robins, H. W. Sargent, A. L. Scott, A. Sherbo, W. Stone, W. S. Worden.
*Assistants:* Norma H. Austin, J. D. Bailey, J. C. Bale, R. W. Barzak, J. E. Bellamy, J. X. Brennan, J. Bullaro, C. E. Chumley, W. E. Colburn, T. E. Coleman, G. S. Conkin, M. A. Crane, H. K. Crockett, M. M. Culver, S. C. Dodge, J. L. Donovan, Pauline Drawver, T. H. Driscoll, W. E. Edens, J. R. Elwood, Sarah L. Feldner, J. B. Foster, Mary A. Foulk, R. E. Freeman, Katharine T. Gill, J. B. Gleason, L. A. Gottfried, P. E. Grabill, S. L. Gross, E. Hansen, V. E. Harder, G. B. Hardy, A. Hayman, Mary A. Hussey, G. E. Jones, Julia D. Knuppel, Marie Larsen, R. S. Leever, W. C. McAvoy, D. E. McCoy, Sonia Miller, F. B. Moake, R. H. Morrison, Iris D. Mueller, H. K. Nixon, R. B. Ogle, R. E. O'Neill, H. E. Pendleton, H. Presley, Laura M. Proctor, R. J. Purdum, W. H. Reuter, O. L. Rice, J. E. Robinson, J. S. Romine, D. Rudolph, H. F. Salerno, J. E. Smythe, B. A. Sokoloff, R. L. Stevens, J. T. Stokes, R. K. Stone, A. C. Tillman, W. T. Tucker, Audrey G. Vilaró, L. C. Wagy, S. Warschausky, G. T. Watkins, J. H. Webb, R. Wiegand, C. T. Wilkins, H. W. Wilson, Verna D. Wittrock, Margaret B. Zwick.

#### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** A course in Shakespeare and twenty additional hours in English (excluding English 101, 102, 103, 121, 122, and Rhetoric 100, 101, 102, 151, 200, 242, 271, 272). Of these twenty additional hours, seventeen must be taken in English or American literature including three hours from each of the following groups: (1) English 311, 313, 314, 326, 342; (2) English 235, 325, 336, 346; (3) English 245, 251, 310, 347, 349.

**Minors:** Twenty hours in (a) Latin, Greek, French, German, Spanish, Italian, or Portuguese; or (b) in any two of those languages; or (c) in one of those languages and philosophy; or (d) in one of those languages and history; or (e) in history and philosophy; or (f) program in medieval civilization studies sponsored by the Division of the Humanities. No language courses may be regarded as satisfying the minor requirements if they are excluded from the majors of the language departments, with the exception of elementary courses in Greek and Latin, French 103, 104, Italian 103, 104, Spanish 103 and 104, and German 103. At least eight hours must be taken in each subject, if two are chosen.

English majors who intend to teach in secondary schools must see the adviser on special curriculum.

**Major in Composition:** See page 331.

## English Literature

#### COURSES FOR UNDERGRADUATES

**101. Introduction to Poetry.** Understanding of poetry through the reading and discussion of representative poems. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 102 and 103, satisfies the humanities requirement in general education. Bloom, Busey (in charge), Campbell, Goldman, Landis, Quinn, Stillwell, Weirick.

**102. Introduction to the Drama.** Understanding of drama through the reading and discussion of representative plays. The reading list will include selections from Greek, Elizabethan, and modern English, continental, and American drama. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for

English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 101 and 103, satisfies the humanities requirement in general education. Busey, Hamilton, Haskell (in charge), Holaday, Rapp, Rogers, Sherbo, Warren.

**103. Introduction to Fiction.** Understanding of fiction through the reading and discussion of representative short stories and novels. The reading list will include Jane Austen's *Pride and Prejudice,* Balzac's *Père Goriot,* Dostoevski's *Crime and Punishment,* E. M. Forster's *A Passage to India,* and Hemingway's *A Farewell to Arms.* I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Credit is not given for English 101, 102, and 103 in addition to English 121 and 122. This course, plus English 101 and 102, satisfies the humanities requirement in general education. Bailey, Gettmann, Harkness, Ray, Robins, Sherbo, Stone, Worden.

**121. Chief English Writers Before 1800.** *Canterbury Tales, Utopia,* three plays of Shakespeare, *Paradise Lost, Gulliver's Travels, Tom Jones, Life of Johnson, Rasselas.* Particularly recommended for students in professional and technical courses, such as law, medicine, commerce, engineering, etc. I, II; 4. Credit is not given for English 121 in addition to English 101, 102, and 103. This course, plus English 122, satisfies the humanities requirement in general education. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. Bloom, Campbell, Davidson, Evans, French (in charge), Mathews, Scott, Sherbo, Stillwell, Stone.

**122. Chief English Writers of the Nineteenth Century.** Wordsworth, Byron, Carlyle's *Past and Present,* Arnold's prose and poetry, FitzGerald's *The Rubaiyat of Omar Khayyam,* readings from T. H. Huxley, Browning's poems, and two novels. Particularly recommended for students in professional and technical courses, such as law, medicine, commerce, engineering, etc. I, II; 4. Credit is not given for English 122 in addition to English 101, 102, and 103. This course, plus English 121, satisfies the humanities requirement in general education. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. Bloom, Butler, Dugas, French (in charge), Harkness, Kelso, Mathews, Robins, Stillwell, Townsend.

**131. Introduction to Shakespeare.** I, II; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. Evans, Landis, Shattuck, Warren.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Literary Study of the Bible.** I; 3. Fletcher.

**215. English Poetics.** A study of the nature of poetry, of the history and theory of poetic forms, and of the more important metrical patterns in English. I; 2. Goldman.

**231. Shakespeare.** I, II; 3. Evans.

**235. English Drama Previous to Shakespeare.** From the beginning to 1600. I or II; 3. Holaday.

**245. English Literature from 1688 to 1789.** Swift, Defoe, Steele, Addison, Dryden, Pope, Gray, Goldsmith, Johnson, etc. I or II; 3. Secord.

**246. English Literature from 1789 to 1837.** Wordsworth, Coleridge, Scott, Byron, Shelley, Keats. I; 3. Landis.

**251. Great Novelists of the Eighteenth Century.** Defoe, Richardson, Fielding, Smollett, Sterne, Goldsmith, etc. II; 3. Secord.

**252. Great English Novelists of the Nineteenth Century.** Austen, Scott, Brontë, Thackeray, Dickens, Meredith, James, Hardy, Conrad, Eliot. I or II; 3. Gettmann.

**253. Great Foreign Novelists in Relation to the English Novel.** Goethe, Hugo, Balzac, Flaubert, Zola, Turgenev, Dostoevski, Tolstoi. I, II; 3. Gettmann.

**263. Early Victorian Literature.** Tennyson, Dickens, Newman, Carlyle, Macauley, John Stuart Mill. I; 3. Townsend.

**264. Victorian Literature from 1859 to 1901.** Browning, Butler, Arnold, Ruskin, Morris, Rossetti, Pater, Swinburne, Wilde, Shaw. II; 3. TOWNSEND.

**265. Tennyson and His Contemporaries.** An intensive reading of the principal poems. I; 3. LANDIS.

**266. Browning.** An intensive reading of the principal poems. II; 3. LANDIS.

**273. Poetry Since 1920.** Investigation of the ideas and methods of representative British and American poets from 1920 to the present day. I, II; 3. Prerequisite: Six hours of English literature. QUINN.

**275. A Study of Biography.** A study of biography from Boswell to the present day, intended primarily for the general reader. II; 3. KELSO.

**281. Development of the Modern Drama.** Readings and lectures. I, II; 3. HERRICK, SHATTUCK.

**297. Thesis and Honors.** I; credit to be arranged. Prerequisite: Senior standing. WARREN and others.

**298. Thesis and Honors.** II; credit to be arranged. Prerequisite: Senior standing. WARREN and others.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Chaucer.** I; 3 hours, or ½ to 1 unit. STILLWELL.

**313. Introduction to the Literature of the Middle Ages.** The literature of western Europe from 1000 to 1500. The literary background and the literature of the castle. I; 3 hours, or ½ to 1 unit. PARRY.

**314. Introduction to the Literature of the Middle Ages.** The literature of western Europe from 1000 to 1500. Lyric poetry, the literature of the cloister and the tavern. II; 3 hours, or ½ to 1 unit. PARRY.

**325. English Literature from 1588 to 1660.** Survey of English literature of the Renaissance. Sidney, Marlowe, Donne, Jonson, Herrick, Bacon, Burton, and other writers. II; 3 hours, or ½ to 1 unit. MILLIGAN.

**326. Spenser.** II; 3 hours, or ½ to 1 unit. GOLDMAN.

**336. English Drama Exclusive of Shakespeare.** From 1600 to 1700. I, II; 3 hours, or ½ to 1 unit. HERRICK.

**338. Tragedy.** Comparative study of masterpieces in several periods of western culture. Major emphasis of the course will be on ancient Greek and Roman, and English Elizabethan and Stuart drama. II; 3 hours, or ½ to 1 unit. WARREN.

**342. The Poetry of Milton.** Origins, forms, artistic and ethical values; Milton's place in English literary history. II; 3 hours, or ½ to 1 unit. FLETCHER.

**346. The Age of Dryden.** A study of Restoration literature, dramatic and non-dramatic, centered around Dryden. I; 3 hours or ½ to 1 unit. EVANS.

**347. Alexander Pope.** Pope's prose and poetry, together with selections from Pope's classical models (in translation). II; 3 hours, or ½ to 1 unit. ROGERS.

**349. Dr. Johnson and His Circle.** The principal writings of Johnson, Boswell, Goldsmith, Reynolds, Burke, Gibbon, and Sheridan. Lectures will establish the position of Johnson's circle in the social and literary life of the second half of the eighteenth century. I, II; 3 hours, or ½ to 1 unit. ROGERS.

**351. The Mid-Victorian Novel.** Thackeray, Charlotte Brontë, Mrs. Gaskell, Dickens, George Eliot, Trollope. I, II; 3 hours, or ½ to 1 unit. RAY.

355. **Survey of English Literature.** From the beginning to 1700. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. FRENCH, MILLIGAN, PARRY, ROGERS.

356. **Survey of English Literature.** From 1700 to 1900. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOLADAY, PARRY, ROGERS.

363. **Introduction to Comparative Literature.** Same as German 363. A comparative study of great books in Greek, Roman, Italian, and Spanish literature. I; 3 hours, or ½ unit. GOLDMAN, HAMILTON, HOLADAY, LANDIS, VAN HORNE, WARREN.

364. **Introduction to Comparative Literature.** Same as German 364. A comparative study of great books in French, German, and English literature. II; 3 hours, or ½ unit. This course, plus English 363 and 253, satisfies the humanities requirement in general education. GOLDMAN, HOLADAY, JACOB, LANDIS, RAPP, REHDER.

371. **History and Principles of Literary and Rhetorical Criticism: Aristotle to Sidney.** Same as Speech 371. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

372. **History and Principles of Literary and Rhetorical Criticism: Sidney to the Present.** Same as Speech 372. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

382. **The Plays of Bernard Shaw.** I; 3 hours, or ½ to 1 unit. SHATTUCK.

383. **English Literature in the Twentieth Century.** An introductory survey emphasizing Shaw, the Edwardian novelists, Yeats, Joyce, Lawrence, Eliot, the Bloomsbury group, the satirists of the 'twenties, and such recent writers as Auden, Orwell, and Graham Greene. I; 3 hours, or ½ to 1 unit. RAY.

## American Literature

### COURSES FOR UNDERGRADUATES

113. **American Literature.** A survey of American literature with emphasis on the historical and cultural background. From 1620 to the Civil War. I, II; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. DAVIDSON, FOSTER, HASKELL, KELLEY, MCCOY, SCOTT, SCOUFFAS, WORDEN.

114. **American Literature.** A survey of American literature with lectures on the historical and cultural background. From the Civil War to the twentieth century. I or II; 3. Prerequisite: Sophomore standing, or exemption from Rhetoric 102. DAVIDSON, HASKELL, KELLEY, MCCOY, SCOTT, SCOUFFAS, WORDEN.

144. **Contemporary Poetry.** American poetry from Whitman to Sandburg; and English poetry from the pre-Raphaelites to Masefield. II; 3. Prerequisite: Six hours of literature, or junior standing. WEIRICK.

### COURSES FOR ADVANCED UNDERGRADUATES

285. **History of the American Short Story.** An historical survey of the American short story, from the early nineteenth century to about 1910, including the study of short story technique and of the changes in subject matter and methods of development and the reading of many representative short stories. I; 3. TRELEASE.

286. **History of the American Short Story.** An historical survey of the American short story from 1910 to the present, including the study of short-story technique and the changes in subject matter and methods of development, and the reading of many representative short stories. II; 3. TRELEASE.

288. **The Twentieth Century American Novel.** An historical and critical study of the development of the American novel from James and Dreiser to the present. Close reading of several representative novels. II, 3. SCOUFFAS.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**310. Colonial and Eighteenth Century American Literature.** Two centuries of American literature, with major emphasis on such figures as John Smith, Winthrop, the Mathers, Edwards, Franklin, Jefferson, Paine, and Freneau. I or II; 3 hours, or ½ to 1 unit. DAVIDSON.

**315. The American Drama.** An historical survey of the American drama from the beginning to Clyde Fitch, including the reading of a large number of representative plays. I; 3 hours, or ½ to 1 unit. Offered in 1953-1954 and in alternate years. FLANAGAN.

**316. The American Drama.** An historical survey of the American drama from the time of Clyde Fitch to the present, including the reading of a large number of representative plays. II; 3 hours, or ½ to 1 unit. Offered in 1953-1954 and in alternate years. FLANAGAN.

**318. The American Novel: Cooper to Norris.** Cooper, Hawthorne, Melville, James, Twain, Howells, Norris. II; 3 hours, or ½ to 1 unit. HASKELL.

**352. American Literature: Irving to Whitman.** A study of the major American writers from 1800 to the Civil War, with particular emphasis on Cooper, Poe, Emerson, Thoreau, Hawthorne, Melville, and Whitman. I or II; 3 hours, or ½ to 1 unit. DAVIDSON.

**353. Studies in Middle Western Literature.** A survey of middle western literature from 1825 to Dreiser, with special emphasis on the development of realism in poetry and fiction. I; 3 hours, or ½ to 1 unit. Prerequisite: English 113 or 114 or one course in American history. Offered in 1952-1953 and in alternate years. FLANAGAN.

**354. Studies in Middle Western Literature.** A survey of middle western literature from Dreiser to the present, with special emphasis on the development of realism in poetry and fiction. II; 3 hours, or ½ to 1 unit. Prerequisite: English 113 or 114 or one course in American history. Offered in 1952-1953 and in alternate years. FLANAGAN.

**375. Henry James and the Technique of Fiction.** A study of the development of Henry James as a novelist, of the influence upon him, and of his influence on novelists of the twentieth century, chiefly American. I; 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor. KELLEY.

## Rhetoric and Composition

**Major:** Twenty hours in English excluding Rhetoric 100, 101, 102, 151, 200, 242, 271, 272, English 101, 102, 103, 121, 122, and including ten hours of English or American literature, at least six of which must be chosen from the advanced groups, and ten hours of composition chosen from Rhetoric 133, 144, 205, 206, 227, 230, 255, 256, and including at least one course in expository writing. With the permission of the adviser one of the following courses may be counted toward a composition major: Speech 263, 363, Journalism 227, 229, 266.

**Minors:** Twenty hours in (a) Latin, Greek, French, German, Spanish, Italian, or Portuguese; or (b) in any two of those languages; or (c) in one of those languages and philosophy; or (d) in one of those languages and history; or (e) in history and philosophy; or (f) in any one of these subjects and psychology. No language courses may be regarded as satisfying the minor requirements if they are excluded from the majors of the language department, with the exception of elementary courses in Greek and Latin, French 103, 104, Italian 103, 104, Spanish 103, 104, and German 103. At least eight hours must be taken in each subject, if two are chosen.

### COURSES FOR UNDERGRADUATES

**100. Freshman Remedial Rhetoric and Composition.** Open to students who fail the placement test for admission to Rhetoric 101. Intensive review of fundamentals, with considerable practice in composition. Students passing this course will be admitted to Rhetoric 101 without further examination. I, II; no credit. ROBERTS and others.

101. **Freshman Rhetoric and Composition.** This course provides elementary training and practice in the comprehension and expression of written and oral English. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Passing grade on the placement examination or in Rhetoric 100. ROBERTS and others.

102. **Freshman Rhetoric and Composition.** This course provides elementary training and practice in the comprehension and expression of written and oral English. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Rhetoric 101. ROBERTS and others.

111. **English as a Foreign Language.** Essentials of English grammar and sentence structure for students whose native language is not English. Designed especially for students who are not taking full-time work because of inadequate preparation in English. I, II; 3. HUSSEY, WAGY.

113. **English as a Foreign Language.** Pronunciation of English for students whose native language is not English. I, II; 2. BEVERIDGE, GALPIN, HUSSEY.

114. **English as a Foreign Language.** Oral and written composition and reading for students whose native language is not English. I, II; 3. Prerequisite: Rhetoric 111, or consent of instructor. Rhetoric 114 and 115 fulfill English requirements for foreign students. HUSSEY, WAGY.

115. **English as a Foreign Language.** Continuation of Rhetoric 114. I, II; 3. Prerequisite: Rhetoric 114. Rhetoric 114 and 115 fulfill English requirements for foreign students. BEVERIDGE, GALPIN, HUSSEY, WAGY.

133. **Expository Writing.** Individual conferences to be arranged. I, II; 3. Prerequisite: Rhetoric 101 and 102; sophomore standing. BUSEY, KELSO, ROGAHN, WARREN.

144. **Narrative Writing.** Elements and practice of narrative writing. Not a course in short-story writing. I, II; 3. Prerequisite: Sophomore standing: Rhetoric 101 and 102. CULVER, HAMILTON, KELSO, STONE.

### COURSES FOR ADVANCED UNDERGRADUATES

200. **Remedial Writing.** I, II; 3. Prerequisite: Rhetoric 101 and 102; failure on the qualifying examination in English. This course does not count for advanced hours toward graduation. CHUMLEY, CONKIN, JONES, MILLER, RUDOLPH.

205. **Advanced Narrative Writing.** I; 3. Prerequisite: Rhetoric 133 or 144, or similar writing beyond Rhetoric 101 and 102. QUINN, SCOUFFAS, WEIRICK.

206. **Advanced Narrative Composition.** II; 3. Prerequisite: Rhetoric 133 or 144, or similar writing beyond Rhetoric 101 and 102. QUINN, SCOUFFAS, WEIRICK.

227. **Advanced Expository Writing.** Essay writing. Course conducted mainly through personal conferences. I, II; 3. Prerequisite: Rhetoric 133 or 144. TOWNSEND.

230. **The Writing of Poetry.** The practice of the writing of poetry aided by the intensive study of examples. I, II; 3. Prerequisite: Junior standing and six hours of English literature, or consent of instructor. BUSEY.

246. **Modern English Grammar.** Definition and meaning; the use of dictionaries, grammars; a survey of syntax, etc. I, II; 3. Prerequisite: Junior standing. HOOK, MATHEWS.

255. **Creative Writing.** Personal direction in writing: novel, story, play, poetry, essay. I; 2. Prerequisite: Senior standing; consent of instructor. BUSEY, QUINN, SCOUFFAS, TRELEASE, WEIRICK.

256. **Creative Writing.** Personal direction in writing: novel, story, play, poetry, essay. II; 2. Prerequisite: Senior standing; consent of instructor. BUSEY, QUINN, SCOUFFAS, TRELEASE, WEIRICK.

## Business English

### COURSES FOR UNDERGRADUATES

151. **Business Letter Writing.** This course is not counted toward a major in English. I, II; 2. Prerequisite: Rhetoric 101 and 102. ANDERSON (in charge), CHAMBERLIN, DAVIS, FOULK, HARDER, MAGUIRE, SARGENT, TUCKER, WIEGAND.

### COURSES FOR ADVANCED UNDERGRADUATES

271. **Sales Writing.** Same as Journalism 288 and Marketing 288. Direct mail campaigns and company magazine copy. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151; or consent of instructor. MAGUIRE, SARGENT.

272. **Report Writing.** I, II; 2. Prerequisite: Rhetoric 101, 102, and 151; or consent of instructor. ANDERSON, CHAMBERLIN, DAVIS, TUCKER, WEEKS.

# ENTOMOLOGY

*Professors:* W. P. HAYES (Head of Department), W. V. BALDUF, G. C. DECKER, G. S. FRAENKEL, C. W. KEARNS, H. H. ROSS.
*Associate Professor:* V. G. MILUM.
*Assistant Professors:* W. R. HORSFALL, R. C. SANBORN.
*Assistants:* H. E. GRAY, D. L. SHANKLAND, D. M. TUTTLE.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in entomology, excluding Entomology 101, 102, 103, and 131. Zoology 318 and 321 may be applied for major credit. At least five hours must be taken from the advanced group.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: agronomy, bacteriology, botany, chemistry, horticulture, physiology, and zoology.

### COURSES FOR UNDERGRADUATES

NOTE: Entomology 101, 102, and 103 are open to freshmen, and 131 to sophomores, without prerequisites. Either 101 and 102, or 103 are prerequisite to all other courses in the department. Recommended sequences of courses are Entomology 101, 102, 131, 308, 313, 316, 319, 320, for those desiring strictly practical or economic work; 103 and 322 for those interested in the cultural or biological values of insect study. For students whose major is entomology a desirable, though not required sequence is Entomology 101, 102, 131, 308, 309, 310, 313, 316, 317, 318, 319, 320, 322, 323, and 324.

101. **Destructive and Useful Insects.** A practical course covering the fundamentals of methods of injury and benefit by insects, their morphology, physiology, metamorphosis classification, and control. The recognition, nature of injury, life history, habits, and control of the most destructive pests of field crops, vegetables and fruits, household and stored products, domestic animals, and man. Lectures and discussions. Planned to be accompanied by Entomology 102, but may be taken alone. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. HAYES, HORSFALL, KEARNS.

102. **Destructive and Useful Insects.** Laboratory studies of the subject matter covered in Entomology 101. Each lecture and discussion period of 101 is followed by the study of actual specimens of insects, insecticides, etc., illustrating their external and internal anatomy; the various types of mouth parts; metamorphosis; training in the keying out and classifying of insects to order and family; and control measures. Ex-

perience in the recognition of the specific pests discussed in 101 and the damage they do. I, II; 2. Prerequisite: Credit or registration in Entomology 101. MILUM and others.

103. **Life of Insects.** A nontechnical course designed to give a balanced comprehensive picture of insect life: treats insect structures, growth, and relationships with other animal groups; life histories of the principal groups; modes of reproduction, movement, protection, communication, and behavior; interrelation with the physical and biotic environment, parasitism, transmission of diseases, predatism, pollination; how insects benefit and injure man, their control, and their roles in the history of man and the arts. Illustrated lectures and laboratory. This course fulfills a one-semester requirement in the biological sequence of the general education requirement in the College of Liberal Arts and Sciences. II; 4. BALDUF.

131. **Essentials of Beekeeping.** Social life, habits, structures, seasonal management for production of honey and beeswax, and essential pollination of seed and fruit crops. Laboratory includes assembling equipment, apiary practice, and care of honey for market. I, II; 2. Prerequisite: Sophomore standing. MILUM.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

306. **Special Problems.** For students ready to take up some special investigation which may be completed as an undergraduate study or the beginning of a thesis problem for an advanced degree. It may also be used to prepare a thesis for scholastic honors. I, II; 2 to 5 hours, or ¼ to 1 unit. Prerequisite: Senior standing; any of the following: Entomology 131, 308, 309, 310, 313, 317, 318, 319, 320, 322, 323, 324, or Zoology 10 or 321. BALDUF, DECKER, FRAENKEL, HAYES, HORSFALL, KEARNS, MILUM, ROSS.

308. **Insect Pests of Field Crops.** II; 3 hours, or ½ unit. Prerequisite: Entomology 101. Offered in 1952-1953 and in alternate years. HAYES.

309. **Morphology and Taxonomy of Immature Insects.** A study of the structures of nymphs, larvae, and pupae. Devoted to morphological studies which are followed by taxonomic studies in Entomology 310. I; 3 hours, or ½ unit. Prerequisite: Entomology 101; senior standing. Offered in 1953-1954 and in alternate years. HAYES.

310. **Morphology and Taxonomy of Immature Insects.** A study of the taxonomy of nymphs, larvae, and pupae. A sequence to Entomology 309. II; 3 hours, or ½ unit. Prerequisite: Entomology 309. Offered in 1953-1954 and in alternate years. HAYES.

311. **Insect Taxonomy.** A one-semester course in the classification of insects designed for biology teachers and students in agriculture, game management, conservation, zoology, and those in entomology who can not register for both Entomology 317 and 318. Some of the laboratory time will be spent studying and collecting insects in the field. An insect collection will be made and identified. No credit for students who have had both Entomology 317 and 318. S; 5 hours, or 1 unit. Prerequisite: Entomology 101 or 103 or a course in biology.

312. **Entomology for Teachers.** Recognition of the chief orders of insects in their immature and adult stages, how they develop, life cycles, food, habitats, adaptations for feeding, oviposition, movement, protection, defense, making sound and other functions, interrelation with other organisms, environmental and social life. A collection of insects will be mounted, identified, and labeled. Field trips, laboratory, and discussions. S; 3 hours, or ½ unit. Prerequisite: One year of biology, zoology, or equivalent. Offered in 1954-1955 and every third year thereafter. BALDUF.

313. **Medical and Veterinary Entomology.** Training in recognition, classification, methods of injury, habits, and control or destruction of insects, mites, and ticks which are predators, parasites, or disseminators of diseases among men and domestic animals. I; 4 or 5 hours, or ½ or 1 unit. Prerequisite: Entomology 101 and 102, or 103, or Zoology 320. HORSFALL.

**316. Advanced Economic Entomology.** A consideration of the principles underlying ways and means for preventing injury to crops and various products. II; 3 hours, or ½ unit. Prerequisite: Entomology 101 or 103. Offered in 1952-1953 and in alternate years. HORSFALL.

**317. Classification of Insects.** Orders with gradual metamorphosis, and principles of systematic entomology. The distinctive structural features of the orders comprising the Ametabola and Hetermetabola; comparison of various systems of classification of the orders; how to recognize the more common families; practice in keying to species. The principles embrace sources of material, segregation, and preparation of keys, descriptions, bibliographies, and outlines for revisional papers. I; 5 hours, or 1 unit. Prerequisite: Entomology 101 or 103, or equivalent.

**318. Classification of Insects.** Orders with complete metamorphosis, and principles of systematic entomology. Distinctive structural features of the orders comprising the sub-class Holometabola; comparison of the various systems of classification of the orders; how to recognize the more common families; practice in keying to species; literature; biographies. II; 5 hours, or 1 unit. Prerequisite: Entomology 101 or 103, or equivalent.

**319. Chemical Control of Insects.** Discussion and actual practice in the most effective control measures for insect pests; training for professional or commercial work as an entomologist, pest control supervisor, or agricultural agent. II; 4 hours, or 1 unit. Prerequisite: Entomology 101 or 103; senior standing or a course in economic entomology. KEARNS.

**320. Chemistry and Toxicology of Insecticides.** Fundamental information concerning the mode of action, the relationship of chemical structure to toxicity, and the physiological explanation of the chemical poisoning of insects. I; 3 hours, or ½ unit. Prerequisite: One year of biology, or equivalent in animal sciences; a course in organic chemistry; senior standing. KEARNS.

**322. Insect Bionomics.** This phase of the biology of insects deals with life history and conditions of environment that favor abundance of insects representative of various habitats. To include an optional 4 hours of laboratory. II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Entomology 101 and 102, or 103, or Zoology 320; senior standing. HORSFALL.

**323. Insect Physiology.** I; 5 hours, or 1 unit. Prerequisite: A course in internal morphology and a course in organic chemistry; senior standing. FRAENKEL.

**324. Insect Physiology.** II; 5 hours, or 1 unit. Prerequisite: A course in internal morphology and a course in organic chemistry; senior standing. FRAENKEL.

## FOOD TECHNOLOGY

**(Including Dairy Technology)**

*Professors:* L. B. HOWARD (Head of Department), E. O. HERREID, R. R. LEGAULT, P. H. TRACY.
*Associate Professors:* A. I. NELSON, Z. J. ORDAL, S. L. TUCKEY, R. M. WHITNEY.
*Assistant Professor:* F. A. KUMMEROW.
*Instructors:* O. W. KAUFMANN, J. TOBIAS.
*Research Associate:* K. FOX.
*Assistants:* R. H. ANDREWS, B. A. BRACHFELD, S. S. CHANG, R. G. GARNER, G. N. GUPTA, R. H. HENDERSON, H. M. HICKMAN, C. J. HONER, W. J. HOOVER, K. H. HU, G. A. JACOBSON, O. C. JOHNSON, J. KURMANN, G. K. MURTHY, W. W. NAWAR, G. C. POTTER, K. M. SHAHANI, C. H. SPOTHOLZ, M. P. STEINBERG, K. T. YAO.

## Food Technology

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Elements of Food Technology.** Lectures, reference readings, and demonstrations on the preservation and manufacture of food products of all types. I; 3. Prerequisite: Chemistry 133; Physics 101 and 102.

**202. Elements of Food Technology.** Lectures, reference readings, and demonstrations on the preservation and manufacture of food products of all types. II; 3. Prerequisite: Food Technology 201.

**204. Elements of Food Engineering.** Application of engineering principles to food plant operation. II; 3. Prerequisite: Junior standing in food technology or dairy technology, or consent of instructor.

**206. Inspection Trip.** Inspection of typical examples of food preservation and manufacturing plants. A three- to four-day trip required of all seniors in food technology. Estimated expense, $35. II; no credit. Prerequisite: Senior standing in food technology, or registration in Chemistry 329. STAFF.

**269. Raw Materials for Processing.** Same as Horticulture 269. Lectures, reference readings, and laboratory work with fruits and vegetables important to the food processing industry. I; 3. Prerequisite: Botany 100, or equivalent. LOTT, MCCOLLUM.

**270. Raw Materials for Processing.** Same as Agronomy 270. Lectures, reference readings, and laboratory work on cereal grains and oilseeds important to the food processing industry. Local field trips to grain and oilseed storage elevators or mills. II; 3. Prerequisite: Botany 100, or equivalent. DUNGAN, GARNER.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Food Processing.** Lectures, discussions, and pilot plant demonstrations and experiments in preservation of foods by canning, freezing, dehydrating, and fermenting methods. Evaluation of product quality by subjective and objective methods and consideration of factory quality control factors. Field trips to commercial food plants. I; 4 hours, or 1 unit. Prerequisite: Food Technology 201, or equivalent. NELSON.

**302. Food Processing.** Lectures, discussions, and pilot plant demonstrations and experiments in food manufacture including formulation of food preparations from fruits, vegetables, and cereals; preservation of meats, fish, and poultry products; and extraction and refining of vegetable oils. Evaluation of product quality by subjective and objective methods and consideration of factory quality control factors. Field trips to commercial food plants. II; 4 hours, or 1 unit. Prerequisite: Food Technology 202 and 301, or equivalent. NELSON.

**332. Principles of Sanitation in the Processing and Handling of Foods.** Same as Veterinary Pathology and Hygiene 332. A study of the principles of sanitation with appropriate emphasis on practical considerations as they apply to various food processing industries. Control of insects, rodents, and microorganisms; fundamentals of detergency; sanitation of water supplies; waste disposal methods. Government and public health regulations. Local field trips to food processing plants. II; 2 hours, or ½ unit. Prerequisite: Bacteriology 104 and Chemistry 132, or equivalent. ORDAL.

**363. Unit Operations in Food Technology.** Same as Chemical Engineering 363. Fundamentals of heat transfer, fluid flow, extraction, drying, and other unit operations especially adapted to the food and biochemical industries. Primarily for students in chemistry and food technology; not open to majors in chemical engineering. Lectures and problems. I; 3 hours, or ¾ unit. Prerequisite: Chemistry 240 or 247; one year of calculus. FINN.

**373. Advanced Food Microbiology.** A study of those foods, food processes, or food ingredients, the production of which involves the biological or enzymatic activities of bacteria, yeasts, or the higher fungi. I; 5 hours, or 1¼ units. Prerequisite: Bacteriology 308 and Chemistry 133, or equivalent. ORDAL.

## Dairy Technology

### COURSES FOR UNDERGRADUATES

**101. Introduction to Dairy Technology.** Development of the dairy industry in the United States and Illinois. The constituents of milk and factors affecting the chemical composition of milk. Nutritive value of milk. Laboratory procedures used in the operation of dairy manufacturing plants. I; 3. Prerequisite: Chemistry 101 or 102, and 105. TUCKEY.

**103. Dairy Products Judging.** Judging market grades of milk and cream. I; 1. HERREID.

**104. Dairy Products Judging.** Judging market grades of condensed milk, butter, cheese, ice cream, and powdered milk. II; 1. HERREID.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Special Problems in Dairy Technology.** I, II; 5. Prerequisite: Senior standing; approval of head of department. TRACY.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Ice Cream Manufacture.** Technical problems and methods involved in the manufacture of commercial ice cream, sherbets, and ices. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TOBIAS, TRACY.

**302. Creamery Butter Manufacture.** Preparation of cream, churning, and packaging of butter. II; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TUCKEY.

**303. Cheese Manufacture.** Manufacture and ripening procedures for domestic and foreign types of cheese. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TUCKEY.

**304. Market Milk.** Production, quality control, assembling, and processing of fluid milk and related products. I; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. HERREID.

**306. Condensed Milk and Milk Powder Manufacture.** Methods of manufacturing different types of condensed and dried milks. II; 3 hours, or ½ unit. Prerequisite: Dairy Science 150 and 151; Dairy Technology 101. TOBIAS, TRACY.

**308. Plant Management.** Problems in the organization, financing, labor management, and operation of dairy plants. II; 3 hours, or ½ unit. Prerequisite: Senior standing in dairy technology. TRACY.

## FORESTRY

*Professor:* J. N. SPAETH (Head of Department).
*Associate Professors:* W. R. BOGGESS, L. B. CULVER, R. W. LORENZ, C. S. WALTERS.
*Assistant Professors:* W. F. BULKLEY, R. E. NELSON, R. G. RENNELS.
*First Assistants:* H. W. FOX, J. J. JOKELA, W. L. MEEK.
*Assistants:* G. R. CUNNINGHAM, F. W. MCMILLAN.

### COURSES FOR UNDERGRADUATES

**101. General Forestry.** The forest as a renewable natural resource; the aims and scope of forestry; economic and social importance of forests to the nation; the principal forest regions and species; forests for timber supply, for water conservation, for recreation, and for wild life; the principles of forest management and protection; the development of public and private forestry in the United States; forestry as a profes-

sion. I, II; 3. Prerequisite: Enrollment in preforestry curriculum, or sophomore standing. RENNELS.

**102. Farm Forestry.** This course should be particularly helpful for those preparing for work in agricultural extension, soil conservation, and teaching vocational agriculture. A study of those phases of forestry which are applicable on Illinois farms. Includes identification of the principal trees; identification, properties, and uses of common woods; harvesting and marketing of principal products of farm woodlands; preservative treatment of farm timbers; measurement of logs, trees, and stands; determination of growth rate and value; life history of the forest and silvicultural handling of woodlands including the care of growing forests and the selection of trees for harvest; natural reproduction of forests and tree planting for wood products, erosion control, and windbreaks; protection of woodlands; place of farm woodlands in the agricultural economy; public aids to woodland owners; and educational programs for youth and adults. I, II; 3. Prerequisite: Enrollment in the College of Agriculture, College of Education, or consent of instructor. RENNELS.

# FRENCH

**(Including Russian)**

*Professors:* J. R. SMILEY (Head of Department), J. F. JACKSON, C. A. KNUDSON.
*Associate Professors:* C. C. GULLETTE, P. E. JACOB, P. KOLB, ANGELINA R. PIETRANGELI.
*Assistant Professors:* FRANCES F. SOBOTKA, C. P. VIENS.
*Instructors:* R. E. HALLOWELL, B. H. MAINOUS, F. W. NACHTMANN (on military leave), R. E. OLIVER, G. M. OUDYN.
*Assistants:* J. ALEXANDER (on leave), PATRICIA C. ANNABLE, J. H. BALTZELL, T. E. COMFORT, ROBERTA R. HARRISON, J. KEMPERS, ELAINE F. NEWKIRK, E. G. PORTER, CORDELIA REED.

## REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours of French excluding French 101, 102, 103, and 113, and including at least five hours from the group for advanced undergraduates and graduates.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject if two are chosen: education, English (excluding Rhetoric 101 and 102), German, Greek, history, Italian, Latin, library science, medieval civilization studies, philosophy, Portuguese, Russian, and Spanish.

## COURSES FOR UNDERGRADUATES

**101. Elementary Course.** Grammar, pronunciation, reading of modern authors, composition, and conversation. For students who have had no work in French. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation for French 101 without 102. MAINOUS and others.

**102. Elementary Course.** Continuation of French 101. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: French 101, or one year of high school French. STAFF.

**103. Modern French.** Rapid reading of modern authors, syntax, and composition. I, II; 4. Prerequisite: French 102, or two years of high school French. GULLETTE and others.

**104. Modern French.** Continuation of French 103. I, II; 4. Prerequisite: French 103, or three years of high school French. STAFF.

**113. Conversational Practice.** Oral practice for the development of elementary conversational skill and the improvement of pronunciation. Designed as a supplement to French 103 and 104, and open only to students concurrently enrolled in either French

103 or 104. I, II; 1. Prerequisite: French 102, or two years of high school French. KOLB, MAINOUS.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Introduction to French Literature.** I, II; 3. Prerequisite: French 104, or four years of high school French. GULLETTE, HALLOWELL, JACOB, KOLB.

**202. Introduction to French Literature.** I, II; 3. Prerequisite: French 104, or four years of high school French. GULLETTE, HALLOWELL, JACOB, KOLB.

**211. Oral French.** Conversational practice for the development of oral facility. Training in pronunciation and diction. I, II; 2. Prerequisite: French 104, or French 103 and 113. HALLOWELL, KOLB, VIENS.

**212. Oral French.** Continuation of French 211. I, II; 2. Prerequisite: French 211. HALLOWELL, KOLB, VIENS.

**213. Composition.** Training in writing French; translation from English and free composition. I; 2. Prerequisite: French 104. SMILEY.

**214. Composition.** Continuation of French 213. II; 2. Prerequisite: French 213. SMILEY.

**215. Advanced Conversation.** Conversational practice on a more advanced level than in French 211 and 212. I; 2. Prerequisite: French 212. VIENS.

**216. Advanced Conversation.** Continuation of French 215. II; 2. Prerequisite: French 215. VIENS.

**282. Teachers' Course.** A survey of resources, classroom materials, standard practices, and problems in the teaching of French with practical application to actual classroom situations. II; 2. Prerequisite: French 201 and 202, or 211 and 212. GULLETTE.

**291. Thesis and Honors.** For candidates for honors in French and for other seniors. I; 2. STAFF.

**292. Thesis and Honors.** For candidates for honors in French and for other seniors. II; 2. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**309. Survey of French Literature.** I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACKSON.

**310. Survey of French Literature.** II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACKSON.

**317. Modern French Drama.** I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. VIENS.

**318. Modern French Drama.** II; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. VIENS.

**323. French Drama of the Seventeenth and Eighteenth Centuries.** I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. KOLB.

**324. French Drama of the Seventeenth and Eighteenth Centuries.** II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. KOLB.

**331. French Novel of the Nineteenth Century.** From Balzac to Proust. I; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACOB.

332. **French Novel of the Nineteenth Century.** From Balzac to Proust. II; 3 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. JACOB.

333. **Littérature Contemporaine.** In French. Modern poetry from Baudelaire to Valéry; prose writers from 1900 to 1940. I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1953-1954 and in alternate years. JACOB.

334. **Littérature Contemporaine.** In French. Modern poetry from Baudelaire to Valéry; prose writers from 1900 to 1940. II; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1953-1954 and in alternate years. JACOB.

335. **French Civilization.** I; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1952-1953 and in alternate years. JACKSON.

336. **French Civilization.** II; 2 hours, or ½ unit. Prerequisite: French 202, or equivalent, and junior standing; or senior standing and consent of instructor. Offered in 1952-1953 and in alternate years. JACKSON.

## Russian

### COURSES FOR UNDERGRADUATES

101. **First Year Russian.** Reading, writing, oral-aural practice, elements of grammar. I; 4. Prerequisite: Sophomore standing. No credit toward graduation for Russian 101 without Russian 102. KEMPERS, SOBOTKA.

102. **First Year Russian.** Continuation of Russian 101. II; 4. Prerequisite: Russian 101. No credit toward graduation for Russian 102 without Russian 101. KEMPERS, SOBOTKA.

### COURSES FOR ADVANCED UNDERGRADUATES

203. **Second Year Russian.** Reading; oral-aural practice; systematic, functional grammar. I; 4. Prerequisite: Russian 102, or equivalent. SOBOTKA.

204. **Second Year Russian.** Continuation of Russian 203. II; 4. Prerequisite: Russian 203. SOBOTKA.

205. **Reading in Scientific Russian.** Reading of Russian texts in the physical and social sciences. Designed for students who desire to achieve competence in reading Russian scientific material in their subject field. I; 4. Prerequisite: Russian 101 and 102; junior or senior standing, or consent of instructor. SOBOTKA.

206. **Reading in Scientific Russian.** Reading of Russian texts in the physical and social sciences. Designed for students who desire to achieve competence in reading Russian scientific material in their subject field. II; 4. Prerequisite: Russian 205; junior or senior standing. SOBOTKA.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

321. **The Russian Novel of the Nineteenth Century.** Readings in Turgenev and Tolstoi. Historical and literary background of the period. I; 3 hours, or ½ unit. Prerequisite: Russian 204, or consent of instructor. SOBOTKA.

322. **The Russian Novel of the Nineteenth Century.** Readings in Tolstoi and Dostoevski. Historical and literary background of the period. II; 3 hours, or ½ unit. Prerequisite: Russian 321, or consent of instructor. SOBOTKA.

# GENERAL ENGINEERING DRAWING

*Professors:* R. P. Hoelscher (Head of Department), S. G. Hall, H. H. Jordan, C. H. Springer, L. D. Walker.
*Associate Professors:* B. O. Larson, J. E. Pearson, S. H. Pierce.
*Assistant Professors:* R. P. Borri, R. S. Crossman (Emeritus), E. D. Ebert, W. L. Shick.
*Instructors:* H. J. Bokenkamp (on military leave), J. S. Dobrovolny, A. G. Friederich, T. C. Hartley, H. C. Nelson, P. E. Peterson, Grace Wilson.

## COURSES FOR UNDERGRADUATES

**101. Elements of Drawing.** Lettering; orthographic projection; working drawings; chart and diagram drawing; isometric and oblique drawing; freehand sketching; tracings; methods of reproducing drawings. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Plane geometry. Hall and others.

**102. Descriptive Geometry.** Theory of projections; solution of theoretical and practical problems involving size, shape, and relative position of common geometrical magnitudes, such as points, lines, planes, curved surfaces, and solids; intersections, developments, shades and shadows, perspective drawing. I, II; 4. Prerequisite: Plane and solid geometry. Larson and others.

**103. Aircraft Drafting and Lofting.** Aircraft terminology, control and reference surfaces and systems; sheet metal terminology and fabrication; drafting standards and types of drawings; drafting room manuals and standard handbooks; descriptive geometry applied to simple layouts and details; aircraft fastenings; lofting—plane, tapered, and double curved surfaces, airfoils, intersections; practices and standards. I, II; 3. Prerequisite: General Engineering Drawing 101 and 102. Friederich and others.

**104. Advanced Drawing.** Review of orthographic projection and working drawings; isometric, oblique, chart and diagram, topographical, architectural, and structural drawings. I, II; 4. Prerequisite: General Engineering Drawing 101, or equivalent. Ebert and others.

**105. Elements of Drawing.** For students in aircraft maintenance. Lettering, orthographic projection, dimensioning, development, process, and other symbols. I, II; 3. Prerequisite: Plane geometry.

**106. Elements of Drawing.** Lettering; orthographic projection; working drawings; chart and diagram drawing; isometric and oblique drawings; freehand sketching; tracings; methods of reproducing drawings; piping, perspective, and structural drawing. For students in chemical engineering. I, II; 3. Prerequisite: Plane geometry. Walker and others.

**107. Architectural Projections.** Instrumentation; lettering; projection; intersection; conventions; shades and shadows; perspective drawing. For students in architecture. I, II; 2. Prerequisite: Plane geometry. Shick, Wilson, and others.

**108. Architectural Projections.** Shades and shadows; oblique, isometric, and perspective drawing; developments. For students in architecture. I, II; 2. Prerequisite: General Engineering Drawing 107. Shick, Wilson, and others.

## COURSES FOR ADVANCED UNDERGRADUATES

**205. Applied Descriptive Geometry in Geological Problems.** For students majoring in geology. Lettering; orthographic projection; simple working drawings; signs and symbols used in geology; applied isometric and oblique projection; principles of descriptive geometry with special applications to geology. I, II; 3. Prerequisite: Plane

geometry, physical geology (Geology 101), historical geology (Geology 102), or equivalent. DOBROVOLNY and others.

**210. Industrial Production Illustration.** Mechanical and freehand drawings in axonometric, oblique, and perspective; shades and shadows; rendering of drawings with various media including some work with the airbrush; industrial production illustration. An approved elective in all engineering curricula. I, II; 3. Prerequisite: General Engineering Drawing 102, or 107 and 108. SPRINGER and others.

**212. Graphical Calculations.** Use of various types of slide rules with special attention to the log-log scales; rectification of curves from laboratory data to devise empirical equations using various types of coordinate paper; construction and use of nomographs or alignment charts. For students in engineering; accepted as an approved elective in all engineering curricula. I, II; 1. Prerequisite: General Engineering Drawing 101, or equivalent; Mathematics 112, 114, and 122. PIERCE and others.

## GEOGRAPHY

*Professors:* J. A. RUSSELL (Head of Department), J. H. GARLAND, J. L. PAGE.
*Associate Professors:* A. W. BOOTH, F. W. FOSTER.
*Assistant Professor:* R. L. CARMIN.
*Instructor:* J. D. FELLMANN.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major.** Twenty hours in geography in addition to Geography 101, including Geography 371 and at least five hours of courses not open to freshmen. All students electing to major in geography must have had Geography 101 and one of the following: Geography 111 (Introductory Meteorology), 104 (World Regional Geography), 105 (Introductory Economic Geography), or their equivalents. In addition, work in the following fields in geography is recommended: climatology, map construction and map use, field work, advanced economic geography, and the regional geography of at least two major areas of the world, one of which must be in North America. Students are expected to take work outside the department in physical or biological science, social science, statistics, expository writing, principles of effective speaking, and at least one modern foreign language.

**Minors:** Twenty hours chosen from one or two of the following subjects: agricultural economics, agronomy, anthropology, architecture, botany, economics, education, French, geology, German, history, Italian, journalism, landscape architecture, library science, marketing, mathematics, political science, Portuguese, sociology, Spanish, and zoology. At least eight hours must be taken in each subject if two are chosen. The curriculum in international affairs and the Latin-American studies program will be accepted as minors.

**Honors:** Only those students who have four hours credit in Geography 371 and 372 and write a thesis will be recommended for graduation with honors.

### COURSES FOR UNDERGRADUATES

**101. Elements of Geography.** The geographic point of view; elements of the physical landscape; planetary relations, weather, climate, climatic regions, land-forms, natural resources. Geography 101 and 111 meet the general education requirement in the physical sciences; Geography 101 and 104 meet the general education requirement in the social sciences in the College of Liberal Arts and Sciences. Lectures and quiz. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. BOOTH and others.

**104. World Regional Geography.** Survey of the geographic structure of the world: regional patterns of settlement and land utilization; man's occupancy of the world. Geography 104 and 101 meet the general education requirement in the social sciences

in the College of Liberal Arts and Sciences. Lectures and quiz. II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Geography 101 or consent of instructor. GARLAND and others.

**105. Introductory Economic Geography.** Man's utilization of the major economic resources of the world from the standpoint of geographic patterns. Primarily for commerce students but open to others. No credit given to students with credit in Geography 106 at the Chicago Undergraduate Division. Lectures and quiz. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. CARMIN and others.

**111. Introductory Meteorology.** The atmosphere; its composition, functions, and behavior in the production of various weather types; air masses; application to present-day activities. Geography 111 and 101 meet the general education requirement in the physical sciences in the College of Liberal Arts and Sciences. Lectures and quiz. I, II; 3. Prerequisite: Geography 101 or consent of instructor. PAGE and others.

**114. Conservation of Natural Resources.** Regional aspects of the conservation of natural resources (soils, water, biotic, mineral, recreational) with special emphasis on the United States. II; 3. Prerequisite: Sophomore standing. BOOTH.

**123. Geography of Illinois.** Detailed regional study of the state with special emphasis on the cultural relations of Illinois to the rest of the nation. I; 3. Prerequisite: Geography 101, 104, or consent of instructor. GARLAND.

**162. Manufacturing Regions of the World.** A description of each of the major manufacturing regions of the world. Each region is analyzed in terms of the geographic conditions which have influenced its location and its products. I; 3. Prerequisite: Sophomore standing. RUSSELL.

**179. Teaching of Geography.** Review of fundamental factual material; teaching devices; selection of equipment, including texts for upper grade and high schools. S; 2½. Prerequisite: Sophomore standing or teaching experience.

### COURSES FOR ADVANCED UNDERGRADUATES

**211. Agricultural Climatology.** Climatic elements and controls. Types of climate, graphic and cartographic representation of climatic data. Macro and micro climates in relation to agriculture. II; 3. PAGE.

**221. Geography of Western North America.** Occupance patterns of Anglo-America; regions of western United States, Canada, and Alaska; national and international relations of western North America. I; 3. Prerequisite: Eight hours of geography. Offered in 1952-1953 and in alternate years. GARLAND.

**222. Geography of Eastern North America.** Occupance patterns of Anglo-America; regions of eastern United States and Canada; eastern North America as the core of two continental nations. II; 3. Prerequisite: Eight hours of geography. Offered in 1953-1954 and in alternate years. GARLAND.

**231. Geography of Caribbean America.** Physical and cultural landscapes of geographic regions of Mexico, Central America, northern South America, and the West Indies. I; 3. Prerequisite: Junior standing; eight hours of geography, or enrollment in the Latin-American studies program. CARMIN.

**232. Geography of South America.** Physical and cultural landscapes of geographic regions of the southern hemisphere countries of South America. II; 3. Prerequisite: Junior standing; eight hours of geography, or enrollment in the Latin-American studies program. CARMIN.

**272. Introductory Field Geography.** The application of fundamental geographical field techniques to field mapping. This course is designed to develop field mapping skills, to permit practical application of geographical principles, and to provide a basic understanding of field procedures introductory to advanced field geography for the student who later seeks an advanced degree. S; 5 to 8 (depending on duration of camp). Prerequisite: Eleven hours of geography. STAFF.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**313. Climates of the Continents.** A regional treatment of the climates of the world by continents. I; 3 hours, or ½ unit. Prerequisite: Geography 101 and 111. PAGE.

**342. Geography of Europe.** Influence of climate, surface features, and natural resources on the distribution of the people, their industries, and routes of trade. New boundaries and present economic problems in their geographic setting. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography.

**351. Geography of Asia.** A regional geography of Asia with concentration on the monsoon realm of southern and eastern Asia. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography. Offered in 1953-1954 and in alternate years. BOOTH.

**353. Geography of the U.S.S.R.** Physical and cultural regionalism; a survey of natural resources and patterns of human occupance including industry, agriculture, and transportation. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography or consent of instructor. FELLMANN.

**361. Land Utilization.** A geographic consideration of the nature of land utilization from the world, continental, and regional viewpoints. Special emphasis will be placed upon geographic techniques of land inventory, methods of land classification, and the detailed investigation of land utilization in this country and abroad. I; 3 hours, or ½ unit. FOSTER.

**363. Production of Great World Minerals.** Geographic aspects of the mineral industries. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography.

**365. Geographic Aspects of Transportation.** Geographic factors influencing transportation by land, sea, and air. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography.

**366. Problems of Industrial Location.** The relationship between geographic facts of relief, climate, resources, population, and transportation and the industrial location process. Case studies in the effects of transportation networks and rates, sources of materials, labor supply, location of markets, etc., on the selection and evaluation of industrial sites. II; 3 hours, or ½ unit. Prerequisite: Eight hours of geography; three hours of economic geography for commerce students. Engineering and architecture students may register with permission of the instructor. RUSSELL.

**371. Introduction to Research.** Limited to seniors and graduates whose major is geography, and to seniors whose major is in other departments who have twelve hours of geography, including three hours in a regional course. I; 2 hours, or ½ unit. STAFF.

**372. Introduction to Research.** Limited to seniors and graduates whose major is geography, and to seniors whose major is in other departments who have twelve hours of geography, including three hours in a regional course. II; 2 hours, or ½ unit. STAFF.

**373. Map Compilation and Construction.** Laboratory instruction and practice in the basic techniques of map making followed by a consideration of problems involved in the construction of maps for presentation in a reproduced form (i.e., printed, photographed). Included are the selection of proper source materials for the base and body of the map, the compilation and correlation of these materials, and methods of mechanical and photographic reproduction. I; 4 hours, or 1 unit. Prerequisite: Consent of instructor. FOSTER.

**375. Map Reading and Interpretation.** Evaluation of map components, map reading, map interpretation, map history, and survey of world maps and mapping. I; 3 hours, or ½ to 1 unit. Prerequisite: Consent of instructor. BOOTH.

**376. Field Geography.** Techniques and methods of field investigation; reconnaissance and unit area mapping; collection and use of field data; organization and presentation of

material. Field trips limited to the local area. II; 3 hours, or ½ unit. Prerequisite: A declared major in geography. FOSTER.

**378. Descriptive Interpretation of Aerial Photographs.** Reading and interpreting of aerial photographs; their potentialities and limitations as a research tool of geography. II; 2 hours, or ½ unit. Prerequisite: Consent of instructor. BOOTH.

**383. Urban Geography.** The distribution, functions, and internal structure of cities; a geographic analysis and classification of urban centers and their tributary areas. I; 4 hours, or 1 unit. Prerequisite: Eight hours of geography, or consent of instructor. FELLMANN.

**386. Political Geography.** World patterns of nations in relation to their natural environmental backgrounds. European nations; Africa, the exploited continent; national structures in Asia; western hemisphere nations. I; 3 hours, or ½ unit. Prerequisite: Eight hours of geography. Majors or graduate students in political science or history may enroll with consent of the instructor. GARLAND.

## GEOLOGY

*Professors:* G. W. WHITE (Head of Department), C. A. CHAPMAN, F. W. DEWOLF (Emeritus), F. C. FOLEY, R. E. GRIM, J. V. HARRISON, J. L. HOUGH, H. W. SCOTT, H. R. WANLESS.
*Associate Professors:* A. F. HAGNER, P. R. SHAFFER.
*Assistant Professor:* D. M. HENDERSON.
*Instructors:* J. H. FISHER, W. M. MERRILL.
*Assistants:* B. L. BERMAN, J. A. BURGENER, J. J. CHAPMAN, J. B. DROSTE, F. D. ETHERIDGE, E. FRUND, R. L. FUCHS, N. R. GADD, JAYNE GRAY, C. H. HARDIE, W. D. JOHNS, JR., J. C. HATHAWAY, L. G. SCHULTZ, J. W. SHELTON, V. C. SHEPPS, N. F. SOHL, D. B. SNODGRASS, F. L. STAPLIN, J. P. WEHRENBERG, E. G. WILLIAMS.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in geology, excluding Physical Geology 101, Agricultural Geology 105, and Geology for Engineers 150, and including at least five hours of courses not open to freshmen or sophomores. The following courses, in addition to Physical Geology 101, are fundamental for a major in geology: Historical Geology 102, Mineralogy 131 and 132, Geomorphology 301, Structural Geology 311, Paleontology 320, Stratigraphy 321, Field Methods 315, Geology 317, Geology of the San Juan Region, Colorado, General Engineering Drawing 205, General Chemistry 101 or 102, General Physics 101, College Algebra 112, and Trigonometry 114.

Students planning to make geology their major subject are strongly advised to take General Surveying, Civil Engineering 115, or equivalent. The following courses are also recommended for all whose primary interest is in mineralogy, petrology, and economic geology: Analytic Geometry, Mathematics 122; General Physics 102; Qualitative Analysis 105; and Elementary Physical Chemistry 240, or equivalent.

**Minors:** Twenty hours chosen from one or two of the following subjects: astronomy, botany, chemistry, economics, geography, mathematics, physics, zoology, mining engineering, and civil engineering, after consultation with the Department of Geology. At least eight hours must be taken in each subject, if two are chosen.

**Honors:** Only those students who have four hours credit in Geology 290 or 291 and write a thesis will be recommended for graduation with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration.

NOTE: Certain geology courses are offered only in alternate years: Paleobotany 325.

At least one year of graduate work is very desirable as further training for all professional work in geology.

### COURSES FOR UNDERGRADUATES

**101. Physical Geology.** Materials, structures, surface features of the earth and processes which have produced them. Lectures, quiz, and laboratory. One-half day field trip required. Geology 101 and 102 meet the general education requirement in the physical sciences in the College of Liberal Arts and Sciences. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. MERRILL, SHAFFER, and others.

**102. Historical Geology.** Evolution of the earth and its life. Lectures and laboratory. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Geology 101, or Division of General Studies 141. MERRILL.

**105. Agricultural Geology.** Principles of physical geology with emphasis on those useful to students of agriculture. For agriculture students only. I, II; 3. Prerequisite: One semester of chemistry. SHAFFER and others.

**110. Field Work.** Field observations in southern Indiana, eastern Kentucky and Tennessee, including visits to the Great Smoky Mountains, the Cumberland Gap region, and Mammoth Cave. II; 2. Credit will be given only on completion of a satisfactory written report. Prerequisite: Geology 101, 105, 150, or Division of General Studies 141; consent of instructor. SHAFFER.

**130. Mineralogy for Engineers.** Elementary crystallography and minerals of economic and scientific importance. I, II; 3. Prerequisite: One semester of college chemistry. HENDERSON and others.

**131. Mineralogy.** A systematic study of minerals and common rocks. Lecture and laboratory. I; 3. Prerequisite: One semester of college chemistry. HENDERSON and others.

**132. Mineralogy.** Continuation of Geology 131. Lecture and laboratory. II; 3. Prerequisite: Geology 131. HENDERSON and others.

**150. Geology for Engineers.** I, II; 3. Prerequisite: Sophomore standing in the College of Engineering. HOUGH and others.

### COURSES FOR ADVANCED UNDERGRADUATES

**246. Applied Petroleum Geology.** Primarily for students in the College of Engineering. I; 3. Prerequisite: Geology 150, or consent of head of department.

**247. Applied Petroleum Geology.** Continuation of Geology 246. Primarily for students in the College of Engineering. II; 3. Prerequisite: Geology 150, or consent of head of department.

**290. Introduction to Research.** Limited to seniors whose major is geology, and mechanical engineering students who take Geology 246 and 247. Required of geology majors graduating with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration. Only those students who have four hours credit in Geology 290 and 291 and who write a thesis will be recommended for graduation with honors. I; 2. STAFF.

**291. Introduction to Research.** Limited to seniors whose major is geology and mechanical engineering students who take Geology 246 and 247. Required of geology majors graduating with honors. Each student who desires to register must obtain a written statement from the instructor under whom he is to work and present it to the head of the department at the time of registration. Only those students who have four hours credit in Geology 290 and 291 and who write a thesis will be recommended for graduation with honors. II; 2. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Geomorphology.** The study of the history, origin, and characteristics of land forms produced by fluvial, glacial, wind, and wave erosion, or by a combination of these,

acting upon the major kinds of geologic materials and structures. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102. WHITE.

**311. Structural Geology.** Rock deformation and its results. Lectures, laboratory, and field trip. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102.

**315. Field Methods.** Mapping of an area in southern Illinois. Lecture, quiz, and field trips. II; 3 hours, or ½ unit. Credit will be given only on completion of a satisfactory written report. Prerequisite: Geology 102. WANLESS.

**316. Field Geology.** Geology of the Baraboo, Wisconsin, region. A field course covering structural, stratigraphic, glacial, and physiographic features. The emphasis is on methods of study and interpretation. A comprehensive report is required in order to provide training in geological report writing. Field trip scheduled for August 19 to September 6, 1952. Estimated travel expense, $60. S; 4 hours, or 1 unit. Prerequisite: Geology 102, or equivalent; consent of instructor. HOUGH.

**317. Geology of San Juan Region, Colorado.** Field course to be conducted from campus of Fort Lewis Agricultural and Mechanical College near Durango, Colorado. Field training in stratigraphy, structure, and geomorphology. Geologic mapping with plane table and aerial photographs. Scheduled for June 13 to August 9, 1952. Estimated expense, $258 to $313. S; 8 hours, or 2 units. Prerequisite: Geology 102; consent of instructor. MERRILL and others.

**320. Invertebrate Paleontology.** Fossil groups in biological sequence. Lectures and laboratory. I, II; 4 hours, or 1 unit. Prerequisite: Geology 102.

**321. Stratigraphy.** General stratigraphy, fossil faunas, with special reference to invertebrates and correlation. Emphasis is placed on physical history. I, II; 4 hours, or 1 unit. Prerequisite: Geology 320. SCOTT.

**325. Paleobotany.** Same as Botany 325. The structure, phylogeny, and geological distribution of representative fossil plants. Two or three field trips. II; 3 or 5 hours, or ½ or 1 unit. Prerequisite: Botany 100 or Division of General Studies 131 and 132; Geology 101, or consent of instructor. Offered in 1952-1953 and in alternate years. STEWART.

**335. Optical Mineralogy.** Study of the optical properties of minerals and the use of the petrographic microscope. Emphasis is placed on the identification of minerals by the immersion method. Designed for students in geology, ceramics, chemistry, mining, and agriculture. I; 4 hours, or 1 unit. Prerequisite: Geology 132. CHAPMAN.

**336. Petrography.** Study of the constituents, composition, textures, structures, and classification of rocks. In the laboratory rocks are studied in hand specimen and thin section. Emphasis is placed on the ordinary methods of petrographical investigation. II; 4 hours, or 1 unit. Prerequisite: Geology 335. CHAPMAN.

**351. Geophysics of Mining.** Same as Mining Engineering 351. Principles of geophysics and their application to mining processes. I; 3 hours, or 1 unit. Prerequisite: Senior standing in engineering or geology, or consent of instructor. WUERKER.

**354. Mining Geology.** Same as Mining Engineering 354. Structure and occurrence of mineral deposits in relation to prospecting, exploration, development, and exploitation. II; 4 hours, or 1 unit. Given in alternate years. Prerequisite: Geology 101 or 150, 130 or 131, and Mining Engineering 201 or 230, or consent of instructor.

## GERMAN

*Professors:* H. REHDER (Head of Department), J. T. GEISSENDOERFER, E. A. PHILIPPSON, D. W. SCHUMANN, C. A. WILLIAMS (Emeritus).
*Associate Professors:* J. R. FREY, F. J. NOCK, H. STEGEMEIER.
*Assistant Professor:* MIMI I. JEHLE.

*Instructors:* F. G. Banta, R. R. Brewster, M. Dufner, Pauline Steiner.
*Assistants:* C. Carrier, A. M. Cress, B. L. Jennings, J. Kempers, Anne E. Liard, Elizabeth Sands, R. S. Sears, Beatrice Sternberg, Charlotte S. Streisinger, Lois A. Westen (first semester).

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in German excluding German 101, 102, 103, and 113, and including at least six hours in courses in the 300 group (normally 301 and 302), or equivalent.

**Minors:** Twenty hours in not more than two subjects chosen from the following list, with at least eight hours in each subject: education, English (excluding Rhetoric 101 and 102), French (excluding 101), Greek, history, Italian, Latin, library science, philosophy, Portuguese, and Spanish (excluding 101). The Department of German accepts as a minor the course program in medieval civilization studies sponsored by the Division of the Humanities.

### COURSES FOR UNDERGRADUATES

**101. Elementary Course.** Oral practice, reading, and grammar for beginners. Not open to students who have had high school credit in this language. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for German 101 without German 102. Staff.

**102. Elementary Course.** Continuation of German 101. Oral practice, reading, and grammar. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: German 101, or one year of high school German. Staff.

**103. Intermediate Course.** Modern narrative prose. Oral practice and sight reading. I, II; 4. Prerequisite: German 102, two years of high school German, or equivalent. Staff.

**104. Intermediate Course,** Continuation of German 103. Literary reading. Classical and modern narrative prose. Oral practice and sight reading. I, II; 4. Prerequisite: German 103, three years of high school German, or equivalent. Staff.

**113. Practice in Conversation.** Oral practice for the development of elementary skill in conversation and the improvement of pronunciation. This course is supplementary to German 103 and 104. I, II; 2. Prerequisite: German 102, or two years of high school German; concurrent registration in German 103 or 104. Jehle.

**144. Scientific Reading.** Rapid reading of scientific prose. Parallel with German 104. Students may not take both German 104 and 144 for a total of more than four hours credit without permission of the department. II; 4. Prerequisite: German 103, three years of high school German, or equivalent. Staff.

### COURSES FOR ADVANCED UNDERGRADUATES

**210. Masterpieces of German Literature.** Introduction to German literature, its subjects, forms, and ideals. I, II; 3. Prerequisite: German 104, 144, two years of college German, or equivalent. Rehder.

**211. Conversation and Writing.** I, II; 2. Prerequisite: German 104, or German 103 and 113, or equivalent. Stegemeier.

**212. Conversation and Writing.** Continuation of German 211. I, II; 2. Prerequisite: German 211, or equivalent, or consent of instructor. Stegemeier.

**244. Guided Readings in Scientific Texts I.** Supervised readings in technical literature to be chosen from books or periodicals in consultation with the instructor. Instruction by individual conference. I; 2. Prerequisite: German 104, 144, or equivalent; consent of instructor.

**245. Guided Readings in Scientific Texts II.** Supervised readings in technical literature to be chosen from books or periodicals in consultation with the instructor. Instruction by individual conference. II; 2. Prerequisite: German 104, 144, or equivalent; consent of instructor.

**251. Modern German Fiction.** I or II; 3. Prerequisite: German 210, or equivalent. GEISSENDOERFER.

**252. Modern German Drama.** A study of the drama of the nineteenth and twentieth centuries, its relation to the Greek drama and world drama. I or II; 3. Prerequisite: German 210, or equivalent. JEHLE.

**260. Lyrics and Ballads.** A poetical and metrical survey of German lyric verse from its beginning to modern times, with a critical analysis of representative poems. I or II; 3. Prerequisite: German 210, or equivalent. STEGEMEIER.

**270. Twentieth Century German Literature.** Introduction to trends of modern civilization as reflected in contemporary German literature. S; 3. Prerequisite: Two years of German, or equivalent, or consent of instructor. FREY.

**281. Teachers' Course.** An introduction to the problems of the teaching of German and a study of textbooks. I; 2. Prerequisite: Three years of college German, or equivalent. JEHLE.

**291. Senior Thesis and Honors Course.** Intended primarily for candidates for honors in German, but open to other seniors. I; 2. Prerequisite: Senior standing; three years of college German, or equivalent. STAFF.

**292. Senior Thesis and Honors Course.** Intended primarily for candidates for honors in German, but open to other seniors. II; 2. Prerequisite: Senior standing; three years of college German, or equivalent. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. German Literature to the Eighteenth Century.** I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. SCHUMANN.

**302. German Literature Since the Eighteenth Century.** II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. FREY.

**303. Advanced Composition and Syntax.** Intensive study of advanced problems of grammar, syntax, and style. I or II; 2 hours, or ½ unit. Prerequisite: Three years of college German, including German 212 or equivalent. JEHLE.

**311. Goethe.** Introduction to Goethe's life and works. I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1952-1953 and in alternate years. GEISSENDOERFER.

**312. Goethe's Faust.** Intensive study of Goethe's *Faust,* Parts I and II. II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1952-1953 and in alternate years. GEISSENDOERFER.

**320. History of German Civilization.** A selected topical, historical, and pictorial analysis of German culture and civilization. I or II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. STEGEMEIER.

**331. German Classics I.** Study of the works of Lessing, Herder, and Wieland. I; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1953-1954 and in alternate years. GEISSENDOERFER.

**332. German Classics II.** Study of the works of Schiller, Kleist, Hölderlin, and Jean Paul. II; 3 hours, or 1 unit. Prerequisite: Three years of college German, or equivalent. Offered in 1953-1954 and in alternate years. GEISSENDOERFER.

**360. Introduction to German Phonetics.** Study of the sounds of the German language and their transcription in the international phonetic alphabet. I; 2 hours, or ½ unit.

Prerequisite: Senior standing; three years of German, or equivalent; consent of instructor. NOCK.

363. **Introduction to Comparative Literature.** Same as English 363. A comparative study of great books in Greek, Roman, Italian, and Spanish literature. I; 3 hours, or ½ unit. GOLDMAN, HAMILTON, HOLADAY, LANDIS, VAN HORNE, WARREN.

364. **Introduction to Comparative Literature.** Same as English 364. A comparative study of great books in French, German, and English literature. II; 3 hours, or ½ unit. GOLDMAN, JACOB, LANDIS, RAPP, REHDER, WARREN.

## Greek

(See Classics)

## Health Education

(See Physical Education)

# HISTORY

*Professors:* F. C. DIETZ (Head of Department), A. E. BESTOR, R. G. BONE, P. V. B. JONES (Emeritus), C. E. NOWELL, J. G. RANDALL (Emeritus), W. S. ROBERTSON (Emeritus), F. S. RODKEY, F. A. SHANNON, R. P. STEARNS, J. W. SWAIN.
*Associate Professors:* R. N. CURRENT, E. L. ERICKSON, C. G. STARR.
*Assistant Professors:* NATALIA M. BELTING, LOUISE B. DUNBAR, F. B. FREIDEL, AMEDA R. KING, N. F. NORMAN, MARY L. SHAY, J. B. SIRICH, R. M. SUTTON.
*Instructors:* W. J. BOUWSMA, C. E. DAWN.
*Assistants:* H. C. BOREN, W. GLICKMAN, A. Q. LARSON, G. W. MORELL, C. G. NAUERT, D. B. SAILOR, E. W. SIGMUND, D. F. TINGLEY, S. J. TONSOR, J. WEAVER.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in history, including ten hours in courses having junior standing as a prerequisite, and any other courses offered by the department except courses taken in the first year.

**Minors:** Twenty hours (excluding courses taken in the freshman year) selected from one or two of the following subjects: economics, English and American literature, geography, law, library science, philosophy, political science, and sociology. Courses in one ancient or modern language (except such as are primarily designed for freshmen) will be accepted as one of the two minor subjects. The curriculum in international affairs will be accepted as a minor.

### COURSES FOR UNDERGRADUATES

101. **Introduction to General Social Sciences.** A survey of the principal political, economic, and social ideas and institutions as they have developed in the civilizations of ancient Greece and Rome, medieval Europe and modern Europe. This course is for non-Liberal Arts students. I, II; 3.

111. **Modern European History from the Renaissance to 1848.** Europe from the age of the great discoveries to the close of the Napoleonic Wars. I; 4. Students with 95 or more credit hours receive only 3 hours credit. NORMAN, STEARNS.

112. **Modern European History, 1848 to the Present.** Development of European nationalism, liberalism, and imperialism; World War; reconstruction. II; 4. Students with 95 or more credit hours receive only 3 hours credit. NORMAN, STEARNS.

**131. History of England to 1688.** History of the British peoples to 1688. I; 3. Students with 95 or more credit hours receive only 2 hours credit. ERICKSON.

**132. History of England, 1688 to 1952.** Modern history of the United Kingdom; colonial and imperial development. II; 3. Students with 95 or more credit hours receive only 2 credit hours. ERICKSON.

**151. History of the United States to 1865.** Colonial foundations, movement for independence, early years of the republic. I; 3. Prerequisite: Sophomore standing. DUNBAR.

**152. History of the United States, 1865 to 1952.** A century of national life and organization. I, II; 3. Prerequisite: Sophomore standing. DUNBAR, KING, SUTTON.

**161. Survey of American Civilization to 1865.** A course designed to fulfill the humanities requirement in general education. I; 4. Prerequisite: Sophomore standing. CURRENT.

**162. Survey of American Civilization Since 1865.** A course designed to fulfill the humanities requirement in general education. II; 4. Prerequisite: Sophomore standing. CURRENT.

**181. The Ancient World.** Ancient empires and Greece. I; 3. Prerequisite: Sophomore standing. STARR.

**182. The Ancient World.** Rome. II; 3. Prerequisite: Sophomore standing. STARR.

### COURSES FOR ADVANCED UNDERGRADUATES

**209. The Near East from Mohammed to Napoleon.** I; 2. Prerequisite: One year of college history; junior standing. NORMAN.

**210. The Near East from Napoleon to the Present.** II; 2. Prerequisite: One year of college history; junior standing. NORMAN.

**219. Tsarist Russia: Its Background, Expansion, and Problems to 1855.** A survey of what is basic in the cultural heritage of the Russian people and the Russian state up to the revolutionary era. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. RODKEY.

**220. Modern Russia and Its Problems, 1855 to the Present.** An analysis of the various currents and factors that have accounted for what is now dominant in the culture and organization of the Soviet Union. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. RODKEY.

**250. History of American Immigration.** Colonial and national periods. II; 2. Prerequisite: One year of college history; junior standing.

**290. Teaching of History.** II; 2. Prerequisite: One year of college history; senior standing.

**291. History of Land Warfare.** I; 3. Prerequisite: One year of college history; junior standing. STARR.

**292. History of Naval Warfare.** II; 3. Prerequisite: One year of college history; junior standing. STARR.

**293. Thesis.** Special training in historical investigation. I; 2 to 4. Prerequisite: Senior standing. STAFF.

**294. Thesis.** Special training in historical investigation. II; 2 to 4. Prerequisite: Senior standing. STAFF.

**295. Reading Course.** Reading in selected fields chosen in consultation with the instructor. I; 2 to 4. Open only to juniors and seniors of high standing. STAFF.

**296. Reading Course.** Readings in selected fields chosen in consultation with the instructor. II; 2 to 4. Open only to juniors and seniors of high standing. STAFF.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. The Middle Ages, A.D. 400 to 1100.** Europe from the fall of Rome to the first crusade. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

**302. The Middle Ages, A.D. 1100 to 1500.** Europe from the rise of towns to the establishment of national monarchy. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

**304. Medieval Civilization.** Religious and intellectual. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science.

**305. The Age of the Renaissance.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

**306. The Age of the Protestant and Catholic Reformation, 1500 to 1648.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. BOUWSMA.

**307. Classical Islam: The Near East from Mohammed to the Crusades.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DAWN.

**308. The Europeanization of the Near East, 1768 to 1914.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DAWN.

**309. The Development of Modern Europe: Absolutism and Colonial Expansion, 1648 to 1789.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SIRICH.

**310. Development of Modern Europe: The French Revolution and Napoleon, 1789 to 1815.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SIRICH.

**311. Europe from 1815 to 1860.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics.

**312. Europe from 1860 to 1900.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics.

**313. European History, 1900 to 1925.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history, political science, or economics. SHAY.

**314. European History, 1925 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. SHAY.

**317. History of Modern Italy, 1700 to 1830.** I; 2 hours, or ½ unit. Prerequisite: One year of college history. SHAY.

**318. History of Modern Italy, 1831 to the Present.** II; 2 hours, or ½ unit. Prerequisite: One year of college history or political science. SHAY.

**322. History of Spain and Portugal.** A survey of the Iberian Peninsula from the earliest times until the present. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in history. NOWELL.

**323. Science, Philosophy, and the Modern European Mind.** Intellectual history of modern Europe, 1543 to 1770. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing and one of the following: History 111 and 112, 131 and 132, Division of General Studies 121 and 122, English 111 and 112, or Philosophy 101. SIRICH, STEARNS.

**324. Science, Idealism, and Materialism.** Intellectual history of modern Europe, 1770 to 1914. II; 3 hours, or ½ to 1 unit. Prerequisite: History 323, or consent of instructor. SIRICH, STEARNS.

**325. Intellectual and Cultural History of Russia to 1881.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. RODKEY.

**326. Intellectual and Cultural History of Russia from 1881 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. RODKEY.

**327. The Russian Revolution.** Development of the revolutionary movement in later nineteenth and early twentieth century Russia; the revolutionary outbreaks of 1905 and their aftermath; the "February" and "October" revolutions of 1917. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science.

**328. History of Soviet Russia from 1917 to the Present.** The founding and development of the Communist regime in the land; that regime's programs, its problems, and its expansion in times since the Russian Revolution. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science,

**333. The History of England from 1377 to 1485.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1953-1954 and in alternate years. DIETZ.

**334. The History of England under the Tudors, 1485 to 1603.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1953-1954 and in alternate years. DIETZ.

**335. Foundations of English and American Democratic Institutions, 1603 to 1689.** A study of the origins and practices of Anglo-American ideals and institutions. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. STEARNS.

**336. Foundations of English and American Democratic Institutions, 1689 to 1783.** A study of the maturation of American democratic ideals and institutions. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. STEARNS.

**339. History of the British Commonwealth in the Nineteenth and Twentieth Centuries, 1783 to 1900.** I; 3 hours, or 1 unit. Prerequisite: One year of college history, preferably History 131 and 132, though 111 and 112 and 151 and 152 satisfy the requirement. ERICKSON.

**340. History of the British Commonwealth in the Nineteenth and Twentieth Centuries, 1901 to the Present.** II; 3 hours, or 1 unit. Prerequisite: One year of college history, preferably History 131 and 132, though 111 and 112 and 151 and 152 satisfy the requirement. ERICKSON.

**343. Social and Economic History of England Since the Beginning of the Industrial Revolution.** Social and economic history of England, 1750 to 1848. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1952-1953 and in alternate years. DIETZ.

**344. Social and Economic History of England Since the Beginning of the Industrial Revolution.** Social and economic history of England since 1848. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in 1952-1953 and in alternate years. DIETZ.

**345. Constitutional History of England to 1485.** I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. DIETZ.

**346. Constitutional History of England from 1485 to the Present.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political science. DIETZ.

**349. The Age of Discovery.** A survey of the history of discovery centering in the great discovery era of the fifteenth and sixteenth centuries, with a brief survey of earlier discovery and a continuation down to the twentieth century. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. Offered in alternate years. NOWELL.

**352. American Colonies in the Seventeenth and Eighteenth Centuries.** I; 3 hours, or ½ to 1 unit.

**354. Foundations of American Society: The Transition to National Life and Organization, 1763 to 1789.** II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. DUNBAR.

**357. Social and Economic History of the United States, 1775 to 1860.** The growth of American economic life and institutions from the Revolution to the outbreak of the Civil War. I; 3 hours, or ½ to 1 unit. Prerequisite: History 152. SHANNON.

358. **Social and Economic History of the United States Since 1860.** The growth of Amer ican economic life and institutions since 1860. II; 3 hours, or ½ to 1 unit. Prerequisite History 152. SHANNON.

359. **The Civil War and Reconstruction.** Remote and immediate causes of the Civil Wa especially from 1850 to 1861, problems of the North and South during the war; th consequences of the war; the efforts to create a new Union, 1865 to 1877, and th new problems created by those efforts. I; 3 hours, or ½ to 1 unit. Prerequisite: On year of college history. SHANNON.

361. **History of the United States, 1877 to 1917.** I; 3 hours, or ½ to 1 unit. Prerequisite One year of college history, political science, or economics. FREIDEL.

362. **History of the United States Since 1917.** II; 3 hours, or ½ to 1 unit. Prerequisite One year of college history, political science, or economics. FREIDEL.

363. **History of the West, 1634 to 1774.** I; 2 hours, or ½ unit. Prerequisite: One year college history. BELTING.

364. **History of the West, 1774 to 1830.** II; 2 hours, or ½ unit. Prerequisite: One year college history. BELTING.

365. **History of Illinois from 1809 to the Present.** Evolution of a typical middle weste commonwealth. I; 2 hours, or ½ unit. Prerequisite: One year of college histor SUTTON.

369. **Political and Constitutional Development of the United States to 1865.** I; 3 hour or ½ to 1 unit. Prerequisite: One year of college history or political science. FREIDE

370. **Political and Constitutional Development of the United States Since 1865.** II; hours, or ½ to 1 unit. Prerequisite: One year of college history or political scienc FREIDEL.

371. **American Intellectual and Cultural History to 1877.** The contribution of social an political thought, religion, science, scholarship, and education to the history American civilization. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One year college history. BESTOR.

372. **American Intellectual and Cultural History Since 1877.** The contribution of soci and political thought, religion, science, scholarship, and education to the history American civilization. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One year college history. BESTOR.

373. **Diplomatic History of the United States to the End of the Nineteenth Century.** 3 hours, or ½ to 1 unit. Prerequisite: One year of college history or political scienc CURRENT.

374. **Diplomatic History of the United States in the Twentieth Century.** II; 3 hours, ½ to 1 unit. Prerequisite: One year of college history or political science. CURREN

375. **History of Latin America to 1824.** A survey of Latin-American history from the di covery of America until 1824. I; 3 hours, or ½ to 1 unit. Prerequisite: One year college history. NOWELL.

376. **Latin America Since 1824.** A history of the Latin-American republics from the independence to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: One course college history. NOWELL.

377. **History of the A.B.C. Powers.** History of Argentina, Brazil, and Chile from the origins to the present. I; 3 hours, or ½ unit. Prerequisite: One course in histor Offered in 1952-1953 and in alternate years. NOWELL.

378. **History of the Caribbean Area.** A survey of the Caribbean, Mexico, and Centr America from the discovery of America to the present. II; 3 hours, or ½ to 1 un Prerequisite: One course in history. NOWELL.

381. **Ancient Greek States.** History of the Greek States from the earliest time to 334 B.C I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**382. Ancient Imperialism.** Alexander and his successors. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**383. Roman Republic.** History of the Roman Republic to 44 B.C. I; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**384. Ancient Imperialism.** The Roman Empire. II; 3 hours, or ½ to 1 unit. Prerequisite: One year of college history. SWAIN.

**391. History of Eastern Asia to 1839.** History of eastern Asia (China, Japan, and Korea) to 1839. I; 2 hours, or ½ unit. Prerequisite: One year of college history.

**392. History of Eastern Asia Since 1839.** History of eastern Asia (China, Japan, and Korea) since 1839. II; 2 hours, or ½ unit. Prerequisite: One year of college history.

### History of Art

(See Art)

## HOME ECONOMICS

*Professors:* JANICE M. SMITH (Head of Department), J. LITA BANE (on leave), KATHRYN V. BURNS, NELLIE L. PERKINS.

*Associate Professors:* GRACE B. ARMSTRONG (on leave), HARRIET T. BARTO, FANNIE M. BROOKS (Emerita), EDNA W. HATTON (Emerita), PEARL Z. JANSSEN, FLORENCE M. KING, E. EVELYN SMITH, FRANCES O. VAN DUYNE.

*Assistant Professors:* LULU S. BLACK, MARGUERITTE BRIGGS, PAULINE BRIMHALL, RUTH COOPER, RUTH C. FREEMAN, MARY FUQUA, MARGARET GOODYEAR, EDNA R. GRAY, KATHARINE J. HIVON, DOROTHY J. IWIG, FRANCES JENSEN, GERTRUDE E. KAISER, FLORENCE A. KIMMELSHUE, MARY S. LIGON, HELEN MCCULLOUGH, MARY A. MCKEE, BEULA V. MCKEY, MARIAN W. MCLAUGHLIN, ANNA W. SEARL, MARIAN E. TOLBERT, CLARETA WALKER, GLADYS J. WARD (Emerita), VIRGINIA H. WEAVER (on leave), KATHRYN M. WEESNER, RITTA WHITESEL, HELEN K. ZWOLANEK.

*Associates:* FERN CARL, ERMA COTTINGHAM, GLENNA H. LAMKIN.

*Instructors:* GERALDINE E. ACKER, MYRA L. BAKER, EVELYNNE CEDARLUND, FRANCES E. COOK, GLADYS DANIELS, DOROTHY F. DURRELL, ANNE FLUHR, LUCILE HIESER, HELEN R. MARSHALL, MILLICENT MARTIN, BARBREA A. ROGERS, VIRGINIA SEIDEL, ALICE STUBBS, CATHERINE M. SULLIVAN, MARION SYMPSON, HELEN D. TURNER, MARY VICK.

*Assistants:* LUCILE F. ADAMSON, MARIELLA AIKMAN, MARGARET G. BAKER, OLIVE M. BATCHER, VIRGINIA BUTLER, IRENE CHANG, VIRGINIA R. CHARLES, ALICE FORSYTHE, BARBARA FRANK, CAROLYN W. GREEN, JESSIE K. MCLUCKIE, LORIS R. MATHIS, WINIFRED C. NEWTON, ELIZABETH SHIRLEY, JEAN VERTOVEC, THERESA WALKOWIAK.

#### REQUIREMENTS FOR AGRICULTURAL STUDENTS

See Curriculum in Home Economics (page 64) and in Home Economics Education (page 67).

#### REQUIREMENTS FOR EDUCATION STUDENTS

See Curriculum in Home Economics Education (page 92).

#### REQUIREMENTS FOR L.A.S. STUDENTS

**Major in Home Economics:** Twenty hours as specified in Groups II and III, on page 65. (The courses specified in Group I are required, although they are not counted toward the major. The following courses are also required: Art 185; Chemistry 101 or 102, and 132 or 133; Economics 108; Psychology 100 or 103; Sociology 100; at least six hours in

English literature; and at least eight hours in bacteriology and physiology. Some of these required courses may be counted in Minor A or Minor B as shown below.)

**Minor A:** Twenty hours chosen from one or two of the following subjects: chemistry, bacteriology. At least eight hours must be taken in each subject if two are chosen.

**Minor B:** Twenty hours chosen from one or two of the following subjects: economics, psychology, sociology. At least eight hours must be taken in each subject if two are chosen.

### COURSES FOR UNDERGRADUATES

NOTE: Home economics courses designed particularly for non-major students and not fulfilling the requirements for a major in home economics are: Home Economics 120, 125, 190, 193, 196, and 271.

Other home economics courses (except Home Economics 101, 102, 103, and 104) are also open to non-majors who have the prerequisites listed for the course and the consent of the instructor. Students are referred particularly to Home Economics 161, 162, 180, 182, 185, 186, 201, 202, 285, 286, and 395.

Home Economics 101, 102, 103, and 104 constitute a general integrated core in home economics designed as an experimental unit to give students fundamental learning experiences needed for successful homemaking and to provide the basis for specialization in the professional curricula in home economics. Opening these courses to qualified non-home economics students is contemplated eventually.

**101. Personal Development.** A general home economics course designed to contribute to the development of the student through a better understanding of the essentials of human relationships; techniques of management of time, energy, money, and materials; and principles of nutrition and food preparation. I, II; 5. (Experimental program. Students will be selected on basis of pre-testing.) DURRELL, FLUHR, FUQUA, GOODYEAR.

**102. Personal Development.** A general home economics course designed to contribute to the development of the student through a better understanding of the esthetic, psychological, and managerial aspects of clothing selection and construction. I, II; 5. Prerequisite: For home economics majors, Home Economics 101; for non-home economics students, none. M. L. BAKER, CEDARLUND, DURRELL, GOODYEAR, ZWOLANEK.

**103. Family Living.** A course designed to contribute to an understanding of the family, emphasizing child development, design, and management of the home and its furnishings. I, II; 5. Prerequisite: For home economics majors, Home Economics 102. CEDARLUND, DURRELL, GOODYEAR, MCLAUGHLIN.

**104. Family Living.** A course designed to contribute to an understanding of the family, emphasizing family relationships, meal management, and home management. I, II; 5. Prerequisite: For home economics majors, Home Economics 103. FUQUA, GOODYEAR, MCLAUGHLIN, STUBBS.

**120. Elementary Nutrition.** Fundamental laws of human nutrition; application to the selection of an adequate diet. I, II; 2. Prerequisite: Sophomore standing. BARTO.

**125. Introduction to Foods.** Preparation and service of foods; market selection and costs; food values; consumer problems. I, II; 3. Prerequisite: Sophomore standing. LAMKIN.

**130. Introduction to Foods and Nutrition.** Introductory food preparation and consideration of the nutritional needs of college students. I, II; 2. Prerequisite: High school chemistry or Chemistry 101 or 102, or registration in Chemistry 101. BARTO, FLUHR.

**131. Foods.** Composition and behavior of foods; principles of food preparation. I, II; 3. Prerequisite: Chemistry 132, 133, or 234; Home Economics 130. FLUHR, JANSSEN.

**161. Family Housing.** Relation of housing to family living; basis for choosing house plans, methods of providing housing, financial and social aspects. I, II; 3. Prerequisite: Sophomore standing. M. G. Baker, Goodyear.

**162. The Home and Its Furnishings.** Application of principles of art to the design of the home and its furnishings. Consideration of quality and cost of home furnishings. Survey of historic styles of domestic architecture and furnishings. I, II; 3. Prerequisite: Art 185 and 186. Cedarlund, Weesner.

**170. Introduction to Home Economics.** To give freshmen whose major is home economics a point of view regarding the importance of homemaking and to develop an understanding of the underlying educational philosophy of home economics. I; 1. Durrell, Jensen.

**180. Selection and Care of Textiles.** Testing and identification of cloth, including fiber content, design, construction, and finish with emphasis upon quality and suitability for use. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. King.

**182. Clothing Laboratory.** Fundamentals of clothing construction; fitting problems in the selection of ready-to-wear. I, II; 2. Prerequisite: Home Economics 180, or consent of instructor. Zwolanek.

**185. Clothing.** Psychological, artistic, hygienic, economic, and sociological problems in planning and selecting the wardrobe. I, II; 2. Prerequisite: Credit or registration in Home Economics 180, or consent of instructor. Zwolanek.

**186. Costume Design.** Fundamental principles of apparel designs. Study of the variations in actual and fashion figure proportions and its application to dress design. Opportunity to develop originality in design through the medium of fashion sketching. I, II; 2. Prerequisite: Home Economics 180, Art 185 and 186, or consent of instructor. M. L. Baker.

**190. Clothing Selection.** Economic, artistic, psychological, and hygienic problems in the selection of clothing. Includes no garment construction. I, II; 3. Prerequisite: Sophomore standing. Whitesel.

**193. Decorative Processes.** Designing and construction of articles requiring knitting, crocheting, braiding, tatting, decorative stitches, appliqué, or other decorative processes. For students in the occupational therapy curriculum only. I, II; 3. Prerequisite: Home Economics 182. Daniels.

**196. Weaving.** Principles of hand weaving; origins, development, and appreciation of the art of weaving. For students in the occupational therapy and elementary education curricula. I, II; 3. Daniels.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. The Child and His Development.** Interrelationships in the home and in the community. Readings, discussions, and laboratory. I, II; 3. Prerequisite: Psychology 100 or 103, or consent of instructor. Cooper.

**202. Laboratory in Child Development.** Observation of young children in an environment to promote learning. Limited to home economics majors. I, II; 2. Prerequisite: Home Economics 201. Martin, Perkins.

**210. Family Relationships.** Problems in family living; emphasis on the mental hygiene approach to growth through experiences in family living and to the woman's responsibility for wholesome family relationships. I, II; 3. McLaughlin, Perkins.

**220. Dietetics.** Food requirements of normal adults and children; nutritive value of foods; application to selection of adequate diets at different cost levels. I, II; 3. Prerequisite: Physiology 103; credit or registration in Home Economics 232. Barto.

**228. Hygiene and Home Care of Sick.** II; 1. Prerequisite: Junior standing in home economics. Brimhall.

**232. Food Economics and Meal Management.** Distribution and marketing of the food supply; food costs; retail selection of food commodities; meal management. I, II; 3. Prerequisite: Home Economics 131; Economics 108. LAMKIN.

**240. Quantity Cookery.** Handling food materials in large quantities. Time and cost studies. The department cafeteria and cooperating institutions are used for laboratory work. For students who plan to be dietitians in hospitals or other institutions, or who plan to manage lunchrooms for schools. I, II; 3 or 5. Prerequisite: Home Economics 232; consent of instructor. A food handler's certificate is required. E. E. SMITH, VERTOVEC.

**253. Restaurant Interiors.** Functional planning and decoration. Study of form, color, and textures appropriately combined in fabrics, furniture, and background areas. Suitable fabric structures and finishes. Designed to give the student information and vocabulary necessary to work intelligently with professional decorators. II; 3. WEESNER.

**262. The Home and Its Furnishings.** Creative experience in the use of color and texture, and the arrangement and design of furniture in the home. Interiors of homes are designed, elevation drawings are rendered in color; survey of contemporary designers and modern trends and new products. Field trips to shops and homes. I, II; 3. Prerequisite: Home Economics 162. WEESNER.

**271. Home Management.** Methods for determining the use of time, energy, money, and materials in the home. Relationship between various aspects of homemaking. Emphasis on plans for use of time and money; buying problems. I; 2. GOODYEAR, JENSEN.

**272. Organization and Management of the Home.** Techniques of management of time, energy, money, and materials. Consideration of application of subject matter in various fields of home economics to the home. Emphasis on financial management and consumer problems. I, II; 3. Prerequisite: Home Economics 130; Economics 102 and 103, or 108. GOODYEAR.

**273. Home Management.** Application of management principles and methods to specific situations while in residence in the home management house four weeks during the semester. Emphasis on food management, use of equipment, and evaluation of some homemaking practices. I, II; 3. Prerequisite: Home Economics 220, 232, 272, and/or consent of instructor. STUBBS.

**277. Teaching of Home Economics.** Problems dealing with the teaching of home economics in the high school. Required of all who wish to be recommended to teach home economics. I, II; 3. Prerequisite: Home Economics 182, 185, and 232; senior standing. SYMPSON.

**285. History of Costume.** Costumes and their settings from the early Egyptian period through the ninteenth century. I; 2. M. L. BAKER.

**286. Clothing.** Design and construction of clothing; pattern making; fitting problems; custom made finishes. I, II; 3. Prerequisite: Home Economics 182, 185, and 186. WHITESEL.

**291. Thesis.** Intended primarily for candidates for honors but open to other seniors. I; 3 to 5. Prerequisite: Senior standing; approval of head of department. GOODYEAR, JANSSEN, KING, PERKINS, E. E. SMITH, TOLBERT, VAN DUYNE, WEESNER.

**292. Thesis.** Intended primarily for candidates for honors but open to other seniors. II; 3 to 5. Prerequisite: Senior standing; approval of head of department. GOODYEAR, JANSSEN, KING, PERKINS, E. E. SMITH, TOLBERT, VAN DUYNE, WEESNER.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Advanced Problems in Home Guidance of Children.** Emphasis is placed upon the functions and relations of routine and creative activities and the interplay of personalities in the total behavior patterns with a view to helping students understand the less obvious and more subtle aspects of child development, to differentiate between

desirable and undesirable guidance procedures practiced by adult members of the family. Limited to home economics majors. II; 3 hours, or ½ to 1 unit. Prerequisite: Home Economics 201 and 202; consent of instructor. COOPER, PERKINS.

305. **Human Heredity.** Heredity in man and its relation to various individual and social problems. Lectures, discussions, and demonstrations. I; 3 hours, or ½ unit. Graduate credit does not count toward a major in genetics. ROBERTS.

320. **Diet in Disease.** I, II; 3 hours, or ½ unit. Prerequisite: Home Economics 220. BARTO.

322. **Physical Growth and Nutrition.** Lectures, readings, and discussions. I; 2 hours, or ½ unit. Prerequisite: Home Economics 220; senior standing; consent of instructor. J. M. SMITH.

323. **Recent Advances in Foods and Nutrition.** A course designed to present new developments in foods and nutrition through readings, lectures, and discussions. S; 2 hours, or ½ unit. Prerequisite: Chemistry 132 or 133; Physiology 103 or 110; Home Economics 131 and 220.

324. **Problems in Nutrition.** Discussions and investigations. I or II; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Home Economics 220; Chemistry 350; senior standing. TOLBERT.

326. **Demonstration Problems and Techniques.** Consideration of the techniques of demonstrations and problems involved. S; 3 hours, or ½ unit. Prerequisite: One of the following: Home Economics 232, 262, 272, 301, 379, 380, 386, or consent of instructor. JANSSEN.

329. **Readings in Food and Nutrition.** Reports, discussions, and review of scientific literature. II; 1 hour, or ¼ unit. Prerequisite: Home Economics 220; senior standing; credit or registration in one of the following: Chemistry 350; Home Economics 320, 322, 324, 330, or 331. BARTO, TOLBERT, VAN DUYNE.

330. **Experimental Foods.** A consideration of the manner in which such variables as ingredients, proportions, and techniques in food preparation affect the quality of the product. I, II; 3 hours, or ½ unit. Prerequisite: Home Economics 232; Bacteriology 104. JANSSEN.

331. **Problems in Foods.** Applications of chemical and physical principles to advanced food problems. II; 3 hours, or ½ unit. Prerequisite: Home Economics 330. VAN DUYNE.

345. **Institution Management.** Purchase of food supplies and equipment for institutions; grades of food, judging of quality and cost in relation to season, pure food laws, and government inspection; the storeroom and its management; equipment and furnishing; institution housekeeping, floor plans, and routing; specifications for equipment; inventory of equipment; visits to stores and markets. I, II; 3 hours, or ½ unit. Prerequisite: Credit or registration in Home Economics 240 and Economics 108; consent of instructor. E. E. SMITH.

350. **Institution Dietaries and Administration.** Dietary studies and menu making for various types of institutions, such as dormitories, cafeterias, hospitals, and tearooms; problems of organization, personnel studies, administration of food service, records and cost accountings, professional ethics. Opportunity will be given for observation and practice in various fields. Field trip is required; estimated expense, $40. II; 4 hours, or ½ to 1 unit. Prerequisite: Home Economics 220 and 240; consent of instructor. E. E. SMITH.

351. **Special Problems on Group Feeding with Emphasis on the School Lunch.** Planned for teachers in secondary schools and for home advisers and others interested in community feeding problems. Lectures, discussions, and laboratory practice in quantity food management. Emphasis on the school lunch program as an integral part of the educational system. Special problems in purchasing, floor plans, and equipment will be required of graduate students. No credit for students who have had Home

Economics 350 or 355. S; 3 hours, or ½ unit. Prerequisite: Home Economics 220, 232, or equivalent; consent of instructor. Food handler's certificate required. E. E. SMITH.

**355. Advanced Quantity Cookery and Catering.** Planned for students in the restaurant management curriculum and for other qualified students. Practice in menu making and aspects of management necessary for special catering functions and meal projects. Special lectures and demonstrations emphasizing the artistry of preparation, serving, and merchandising of quality food. Supervised practice in various food service units. Field trips and special assignments. II; 3 hours, or ½ unit. Prerequisite: Home Economics 350; consent of instructor. E. E. SMITH, VICK.

**361. Development and Function of Family Housing.** Same as Agricultural Engineering 361. Study of principles and problem solutions in family housing. Basic functions, plan patterns, types, materials, and structure; economic influences, costs, and adaptations; personal and public interests. Lectures, discussions, and problems. II; 3 hours, or ½ unit. Prerequisite: Home Economics 272, or consent of instructor. CARTER.

**375. Home Equipment.** A survey course in which the basic principles related to the selection, use, and care of household equipment are considered. Individual problems will include an evaluation of sources of information on equipment and equipment performance tests. S; 3 hours, or ½ unit. Prerequisite: Home Economics 272; six advanced hours (Group III courses) in home economics; senior standing; consent of instructor. SULLIVAN.

**377. Home Economics Extension.** History and development; types of county organizations; objectives; extension teaching tools; county program determinations and evaluation. Field trips. II; 3 hours, or ½ unit. Prerequisite: Senior standing in home economics; consent of instructor. BURNS.

**378. Problems in Home Management.** Individual investigation and report of specific problems in the field of home management. I; 3 hours, or ½ unit. Prerequisite: Home Economics 272; consent of instructor. GOODYEAR, PERKINS.

**379. Problems in Home Management.** Individual investigation and report of specific problems in the field of home management. II; 3 hours, or ½ unit. Prerequisite: Home Economics 272; consent of instructor. GOODYEAR, PERKINS.

**380. Textiles.** Textiles from the economic, artistic, physical, and chemical viewpoints. I; 3 hours, or ½ unit. Prerequisite: Home Economics 180; Chemistry 132; Economics 108; senior standing; consent of instructor. KING.

**386. Clothing Design and Construction.** Problems in creating original designs, developing a more thorough understanding of the figure through design adaptation.. Emphasis on adaptability to fabric draping or flat pattern construction. Investigation of sources of inspiration and relationship to significant trends in design. I, II; 4 hours, or 1 unit. Prerequisite: Home Economics 285 and 286; senior standing. KING, WHITESEL.

**388. Problems in Textiles and Clothing.** Investigation and report of specific problems in the field of textiles and clothing. I; 3 hours, or ½ unit. Prerequisite: Home Economics 286 or 380; senior standing; consent of instructor. Each student will undertake an individual problem which in some cases may involve prerequisites in chemistry and physics. KING, WHITESEL.

**389. Problems in Textiles and Clothing.** Investigation and report of specific problems in the field of textiles and clothing. II; 3 hours, or ½ unit. Prerequisite: Home Economics 286 or 380; senior standing; consent of instructor. Each student will undertake an individual problem which in some cases may involve prerequisites in chemistry and physics. KING, WHITESEL.

**395. Fashion Analysis.** Factors affecting design, production, distribution, promotion, and trends in fashion development; forecasting methods of measurement and prediction; price levels—relation to fashion cycle and quality in design and workmanship. II; 3 hours, or ½ unit. Prerequisite: Consent of instructor. KING.

# HORTICULTURE

*Professors:* C. J. Birkeland (Head of Department), H. W. Anderson, J. C. Blair (Emeritus), A. S. Colby, H. B. Dorner (Emeritus), M. J. Dorsey (Emeritus), W. A. Huelsen, M. B. Linford, J. W. Lloyd (Emeritus), F. F. Weinard.
*Associate Professors:* D. Gottlieb, J. R. Kamp, V. W. Kelley, M. B. Linn, R. V. Lott, J. P. McCollum, D. Powell, H. H. Thornberry.
*Assistant Professors:* C. Y. Arnold, W. N. Brown, J. R. Culbert, J. C. McDaniel, J. B. Mowry, L. A. Somers, B. L. Weaver.
*Instructors and First Assistants:* H. C. Barrett, D. F. Dayton, G. M. Fosler, D. D. Hickman, H. R. Kemmerer, A. M. Rhodes, R. K. Simons, A. E. Thompson, J. S. Titus.
*Assistants:* J. W. Abernathie, R. E. Anderson, Thelma S. Beers, K. E. Bell, H. L. Boll, Mary V. Gardner, P. R. Hepler, E. W. Melvin, R. R. Rice, D. C. Saupe, R. M. Takeshita.

## COURSES FOR UNDERGRADUATES

**100. Introductory Horticulture.** A beginning general course showing how horticulture fits into the general field of agriculture and into the economic and social life of the individual; to acquaint the student with horticulture as a specialty or profession and to correlate fundamental plant processes with horticultural practices. This course will be particularly helpful to students in general and vocational agriculture, agricultural extension, and processing of horticultural crops. I, II; 3. No credit for juniors or seniors. Prerequisite: Credit or registration in Botany 100. Arnold, Hickman, Melvin, Simons.

**110. Plant and Animal Genetics.** Same as Agronomy 110, Animal Science 110, and Dairy Science 110. The principles of heredity in relation to plant and animal improvement and veterinary medicine. I, II; 3. Prerequisite: Botany 100; Zoology 104. Alexander, Dayton, Roberts, Touchberry.

**121. Plant Propagation.** Current practices in growing plants from seeds, cuttings, layers, grafts, and buds. Theoretical consideration of these practices. Lectures, discussion, and laboratory. I; 3. Kamp.

**122. Greenhouse Management.** Principles of greenhouse operation, soils, fertilizers, potting, watering, ventilating. Lectures, reference readings, and greenhouse practice. II; 3. Prerequisite: Botany 100; Horticulture 121. Culbert.

**142. Introductory Vegetable Crops.** An introduction to the growth habits, soil and climatic requirements, culture, storage, varietal characteristics, and pests of vegetable crops. II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Horticulture 100, or consent of instructor. R. E. Anderson, Arnold, Brown.

**161. Introductory Pomology and Ornamental Gardening.** Adaptation, growing, harvesting, storage, and marketing of fruits; principles and practices of ornamental gardening. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Botany 100. Colby, Kelley, and assistants.

**162. Small Fruit Culture.** Principles and practices involved in the culture of the grape, raspberry, blackberry, dewberry, currant, gooseberry, blueberry, cranberry, elderberry, juneberry, bush quince, and strawberry. Lectures, assigned readings, and laboratory. II; 3. Prerequisite: Sophomore standing. Offered in 1951-1952 and in alternate years. Colby.

## COURSES FOR ADVANCED UNDERGRADUATES

**201. Special Problems I.** Work may be taken in the following subjects: (a) pomology, (b) vegetable crops, (c) floriculture, (d) fruit breeding, (e) plant pathology. I; 3 to 5. Prerequisite: Twenty hours pertinent to the thesis problem, or approval of head of department. A thesis will be required only if Horticulture 201 and 202 are taken.

Anderson, Birkeland, Colby, Culbert, Fosler, Huelsen, Kamp, Kelley, Linn Lott, McCollum, Powell, Thornberry, Weaver, Weinard.

**202. Special Problems II.** Work may be taken in the following subjects: (f) pomology (g) vegetable crops, (h) floriculture, (i) fruit breeding, (j) plant pathology. II; 3 to 5. Prerequisite: Twenty hours pertinent to the thesis problem, or approval of head o department. A thesis will be required only if Horticulture 201 and 202 are taken Anderson, Birkeland, Colby, Culbert, Fosler, Huelsen, Kamp, Kelley, Linn Lott, McCollum, Powell, Thornberry, Weaver, Weinard.

**204. Spraying.** Same as Agricultural Engineering 204. A study of spray materials and equipment used for control of insects and diseases on horticultural crops. II; 3. Prerequisite: Horticulture 142 or 161, Chemistry 101 or 102, Agricultural Engineering 101, or consent of instructor. Offered in 1951-1952 and in alternate years. Pickard Powell.

**223. Commercial Floricultural Crops.** Commercial production of greenhouse cut flower and pot plants. Lectures, reference readings, and laboratory in the greenhouse. I; 3 Prerequisite: Horticulture 122. Culbert.

**224. Commercial Floricultural Crops.** Continuation of Horticulture 223. II; 3. Prerequisite: Horticulture 223. Culbert.

**226. Tender Bedding Plants.** Commercial production and use of tender ornamental plant grown for bedding purposes. II; 3. Prerequisite: Horticulture 122. Fosler.

**230. Garden Flowers.** Requirements and uses of annuals, bulbs, and herbaceous perennials in the garden. Study of important genera of garden ornamentals. II; 3. Prerequisite: Botany 100. Kamp.

**231. Floral Decorations.** The decorative use of flowers, foliages, and accessories; retail flower store management. Lectures, reference readings, laboratory. For advanced floriculture students only. I; 3. Culbert.

**232. Floral Decorations.** The decorative use of flowers, foliages, and accessories; retail flower store management. Lectures, reference readings, laboratory. For advanced floriculture students only. II; 3. Culbert.

**263. Orcharding.** Discussions, lecture, and laboratory relating to production of deciduous tree fruits, with emphasis on the commercial production of apple and peach. I 5. Prerequisite: Horticulture 161. Simons.

**269. Raw Materials for Processing.** Same as Food Technology 269. Lectures, reference readings, and laboratory work with fruits and vegetables important to the food processing industry. I; 3. Prerequisite: Botany 100, or equivalent. Lott, McCollum

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**307. Fruit Diseases.** Same as Botany 307 and Plant Pathology 307. Symptomatology control measures. Laboratory and field studies of representative diseases. I; 3 hours or ½ unit. Prerequisite: Horticulture 317 or Botany 372. Offered in 1951-1952 and in alternate years. Anderson.

**308. Vegetable and Canning Crop Diseases.** Same as Botany 308 and Plant Pathology 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Horticulture 317 or Botany 372 Offered in 1952-1953 and in alternate years. Linn.

**317. Plant Pathology.** Same as Agronomy 317, Botany 317, and Plant Pathology 317 Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite One year of plant science including Botany 100. Black.

**321. Floricultural Physiology.** Plant hormones; effect of light, temperature, humidity and gases on growth of ornamental plants; principles of disease and insect control

Lectures, assigned readings, and discussion. I; 3 hours, or ½ unit. Prerequisite: Botany 130. WEINARD.

**322. Plant Nutrition.** Soil conditions in relation to the growth of ornamental plants; soil and plant tissue tests, fertilizers and their use; soil-less culture; water supplies and automatic watering. Lectures, assigned readings, discussions. II; 3 hours, or ½ unit. Prerequisite: Botany 130; Agronomy 201. WEINARD.

**333. Marketing Horticultural Products.** Same as Agricultural Economics 333 and Marketing 333. Producing and consuming areas; transportation; refrigeration; agencies, functions, and channels of distribution; cooperatives; marketing costs and factors affecting prices; standardization, grading, and inspection; marketing news service; perishable agricultural commodity act and other regulations; attempts to control surpluses; canning and other processing; foreign trade; consumer preference and expansion of domestic markets. I; 3 hours, or ½ unit. Prerequisite: Agricultural Economics 230, Marketing 101, or five hours of horticulture. KELLY.

**343. Structure and Classification of Vegetable Crop Plants.** Principles of classification and structure of vegetable crop plants with special reference to their use and production. II; 3 hours, or ½ unit. Prerequisite: Botany 100. Offered in 1952-1953 and in alternate years.

**345. Growth and Development of Vegetable Crops.** Factors affecting growth, development, and quality of vegetable crops. Discussions. I; 4 hours, or 1 unit. Prerequisite: Botany 130, or consent of instructor; senior standing. Offered in 1951-1952 and in alternate years. MCCOLLUM.

**361. Current Horticultural Literature.** Assigned topics; review of books, technical journals, and other publications. I; 1 hour, or ¼ unit. GRADUATE STAFF.

**362. Current Horticultural Literature.** Assigned topics; review of books, technical journals, and other publications. II; 1 hour, or ¼ unit. GRADUATE STAFF.

**367. Morphological, Anatomical, and Physiological Characteristics of Fruits.** The major morphological, anatomical, and physiological characteristics of fruit species and varieties. Lecture, discussion, laboratory, and reference reading. I; 3 hours, or ½ unit. Prerequisite: Horticulture 161, Botany 130, Chemistry 132; or consent of instructor.

**379. Research Methods in Plant Pathology.** Same as Agronomy 379, Botany 379, and Plant Pathology 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism; and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Horticulture 317; senior standing. GERDEMANN, GOTTLIEB.

**382. Improvement of Horticultural Crops by Breeding.** Mechanism of hereditary variations and varietal differentiation in horticultural plants as a basis for determining the method of approach to crop improvement problems, with emphasis on asexually propagated crops. II; 3 hours, or ½ unit. Prerequisite: One year of horticulture, or equivalent, exclusive of Horticulture 142 and 161. Offered in 1951-1952 and in alternate years. BIRKELAND.

## HUMANITIES

The Division of the Humanities is composed of the departments of Classics, English, French, German, History, Philosophy, Spanish and Italian, and Speech. It sponsors several courses of interdepartmental interest and purpose, serving the requirements of the College of Liberal Arts and Sciences in general education. Its teaching faculty consists of the full-time faculties of the departments listed, of the rank of instructor and above.

The Division also sponsors the curriculum in medieval civilization described on page 175 and the curriculum in American civilization described on page 173.

### COURSES FOR UNDERGRADUATES

151. **Ideas in Literature I.** History and fiction. Reading of selected works of history and fiction, both classical and modern, and discussion of ethical as well as literary values. I; 3. Prerequisite: Sophomore standing or exemption from Rhetoric 102.

152. **Ideas in Literature II.** Philosophy and fiction. Reading of selected works of philosophy and fiction (including poetry and drama), both classical and modern, and discussion of ethical as well as literary values. II; 3. Prerequisite: Sophomore standing or exemption from Rhetoric 102.

### COURSES FOR ADVANCED UNDERGRADUATES

211. **The Growth of American Culture.** The social, intellectual, and spiritual foundations and development of American life and modes of cultural expression. I; 4. Prerequisite: Junior standing. FREIDEL, PAUL, ROOS.

212. **The Growth of American Culture.** The social, intellectual, and spiritual foundations and development of American life and modes of cultural expression. II; 4. Prerequisite: Junior standing. FREIDEL, PAUL, ROOS.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Introduction to Linguistics.** An introduction to the science of descriptive linguistics. I; 3 hours, or 1 unit. Prerequisite: Fulfillment of the foreign language requirement in Liberal Arts and Sciences, or equivalent. KAHANE.

302. **Comparative Linguistics.** An introduction to the historical aspects of language. II; 3 hours, or 1 unit. Prerequisite: Fulfillment of the foreign language requirement in Liberal Arts and Sciences, or equivalent. HELLER.

## HYGIENE

*Professor:* H. L. LAWDER (Head of Health Center).
*Associate Professors:* G. H. AGATE, MARIE A. HINRICHS, G. F. KOLAR, MAY I. MILLBROOK, MARJORIE M. SMARZO, H. I. TEIGLER.
*Assistant Professors:* T. F. CROWLEY, L. D. LEWIS, F. W. LOGAN, R. B. MONTGOMERY, DOROTHY E. SHELLEY.
*Associate:* G. R. BLACKSTONE (Emeritus).
*Instructors:* DOROTHY F. DUNN, J. OTIS.

### COURSES FOR UNDERGRADUATES

101. **Health Lectures.** This course or Hygiene 104 is required of all undergraduate men and women during their first year of residence. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Students who expect to take Hygiene 210 and 216 should fulfill the undergraduate hygiene requirement by taking Hygiene 104 instead of Hygiene 101. AGATE, CROWLEY, DUNN, HINRICHS, KOLAR, LAWDER, LEWIS, LOGAN, MILLBROOK, MONTGOMERY, OTIS, SHELLEY, SMARZO, TEIGLER.

104. **Personal and Community Hygiene.** This course or Hygiene 101 is required of all undergraduate men and women during their first year of residence. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Those students who expect to take Hygiene 210 or 216 should take Hygiene 104 (the prerequisite). Hygiene 104 is a more comprehensive course than Hygiene 101 for those interested in a more intensive study of personal and community hygiene. It is especially designed for teachers, coaches, social workers, and others who feel they will need this course in their future professional work. AGATE, CROWLEY, DUNN, HINRICHS, KOLAR, LAWDER, LEWIS, LOGAN, MILLBROOK, MONTGOMERY, OTIS, SHELLEY, SMARZO, TEIGLER.

### COURSES FOR ADVANCED UNDERGRADUATES

**206. Sex Education and Family Life.** This course is offered to people who are interested in understanding the problems of sex education and realizing the fullest implications of married life relationships, and especially to students planning to teach sex education and hygiene or do counseling work. Besides class lectures, there are discussions in mixed and divided groups, films, guest lecturers, and use of latest teaching materials in this field. I, II; 2. Prerequisite: Hygiene 101 or 104; consent of instructor. CROWLEY, TEIGLER.

**210. Public Health.** Material presented deals with information about community public health problems and the programs designed to prevent disease and promote health education. This is especially valuable for all people who go into health professions or related community work. Field trips and surveys supplement class work. Teachers, coaches, social workers, sanitary engineers will want this course. I, II; 2. Prerequisite: Hygiene 104. DUNN.

**216. Medical Terminology Correlated with Community Health Problems.** I; 2. Prerequisite: Hygiene 104; registration in occupational therapy curriculum; junior standing or consent of adviser. MILLBROOK.

## Industrial Education

(See Education)

## Italian

(See Spanish and Italian)

# JOURNALISM

**(Including Journalism, Radio, and Advertising)**

*Professors:* F. S. SIEBERT (Director of School of Journalism and Communications), R. R. BARLOW, O. C. LEITER (Emeritus), L. W. MURPHY, A. RAE, C. H. SANDAGE, W. SCHRAMM.
*Associate Professors:* Q. HOWE, R. B. HUDSON, L. W. MCCLURE, M. D. SEIL, J. F. WRIGHT.
*Assistant Professors:* D. E. BROWN, V. R. FRYBURGER, F. E. SCHOOLEY, J. T. TREBILCOCK,
*Instructors:* H. V. CORDIER, H. E. HILL, J. W. JENSEN, I. R. MERRILL, T. B. PETERSON, R. L. RIDER, H. W. SARGENT, F. B. SENGER, A. E. STRANG, J. C. SUTTON, J. B. WOODSON.

### COURSES FOR ADVANCED UNDERGRADUATES

**204. Typography.** Study of type faces, families, and sizes; mechanical equipment; graphic art processes, engraving process, offset, gravure, stereotyping; composing room organization; proofreading; copy fitting; paper. I, II; 2. SEIL and others.

**211. Reporting.** News values and story form; gathering and writing news. I, II; 3. TREBILCOCK and others.

**212. Reporting Practice.** News of public affairs. I, II; 3. Prerequisite: Journalism 211. SUTTON.

**215. Contemporary Affairs.** Major news developments and their background; current political, economic, social, and scientific developments. I; 2. HOWE.

**216. Contemporary Affairs.** Major news developments and their background; current political, economic, social, and scientific developments. II; 2. HOWE.

217. **History of Journalism (United States).** Forerunners of the press; beginnings of journalism in America; colonial press; journalism of the Revolution; the party press; popular journalism in the United States; great editorial leaders of the period of personal journalism; recent leaders and tendencies. I, II; 3. MURPHY.

218. **The Press and Public Opinion.** Critical analysis of the role of the press in a democracy; effects of newspaper practices on public opinion; the role of propaganda; international journalism and public opinion; problems of reporting public affairs. I, II; 3. BARLOW.

223. **Press Photography.** A thorough basic course with emphasis on press-type photography. Students learn to use the Speed Graphic camera, process film, and finish prints. Assignments include news, picture-series, and salon work. I, II; 3. Prerequisite: Journalism 211. WOODSON.

227. **Magazine Article Writing.** Preparation of feature stories and articles; techniques of marketing, marketing analysis, and selling of articles written in the course. I, II; 3. PETERSON.

229. **Critical Writing and Reviewing.** News and comment of the stage, books, movies, and fine arts. II; 2. Prerequisite: Journalism 212, or consent of instructor. MURPHY.

231. **Journalism in a Democratic Society.** Study of the philosophical bases of the functions and the responsibilities of mass communications. I, II; 3. JENSEN, PETERSON.

241. **Newspaper Management.** Principles and methods in the operation of daily and weekly newspapers. Managerial problems of the editorial, advertising, circulation, and commercial printing departments; plant operation. I; 3. Prerequisite: Credit or registration in Journalism 204. RAE.

244. **Community Newspaper Publication.** Study of weekly newspapers in handling news, editorials, features, pictures, and correspondence, and in meeting business, circulation, and advertising problems. It includes one or more field trips for each student, with actual work on a small newspaper; approximate cost to student, $5. II; 3. Prerequisite: Senior standing in the School of Journalism and Communications. STRANG.

261. **Principles of Radio and Television Broadcasting.** An introductory course in the history of American radio and television broadcasting, comparative broadcasting systems, organization and operation of stations and networks, social and legal responsibilities of radio and television, codes and practices of broadcasting, and an introduction to radio and television audience measurement and survey methods. I, II; 2. HILL, HUDSON.

263. **Radio Announcing.** Intensive training in studio procedures and interpretation of radio copy, including news, feature scripts, continuity, and commercials. I, II; 2. Prerequisite: Speech 141, or equivalent; consent of instructor. MERRILL.

264. **Radio Acting.** The techniques and special problems of acting in radio. Lectures, demonstrations, and practical microphone experience, with the emphasis throughout on individual development in interpretation and characterization. I, II; 2. Prerequisite: Consent of instructor. RIDER.

265. **Radio Continuity Writing.** A course in the principles of all forms of nondramatic radio writing, including music program continuity, talks programs, audience participation programs, feature programs, and commercial continuity, with some study of television scripts and commercials. I; 2. Prerequisite: Journalism 261. CORDIER.

266. **Radio Dramatic Writing.** A study of the fundamentals of dramatic script writing, including plotting, characterization, pacing, mood, and the handling of dialogue, transitions, and sound patterns, with some attention given to television drama. II; 3. Prerequisite: Consent of instructor. CORDIER.

267. **Radio Production and Direction.** Study of the basic principles of planning, casting, rehearsing, and airing varied program types, with emphasis on advanced techniques of dramatic production. I, II; 3. Prerequisite: Senior standing in radio curriculum. CORDIER.

**281. Introduction to Advertising.** A survey of the economics, psychology, and philosophy of advertising; preparation of advertisements; selection of media; and organizational structure. I, II; 3. SANDAGE and others.

**282. Advertising Procedures.** Same as Marketing 282. This course is designed to give students who do not wish to major in advertising an opportunity to become familiar with the basic elements of typography, copy, and layout. I, II; 3. Students will not be given credit toward graduation for both Journalism 282 and 382. Prerequisite: Journalism 281, or Marketing 281. WALES.

**283. Current Advertising Developments.** Same as Marketing 283. An analysis of problems, practices, and prospects in the field of advertising as viewed by current practitioners and writers. II; 1. Prerequisite: Senior standing and major in advertising, or consent of instructor. SANDAGE.

**288. Sales Writing.** Same as Marketing 288 and Rhetoric 271. Direct mail campaigns and company magazine copy. I, II; 2. Prerequisite: Rhetoric 101, 102, and 151, or consent of instructor.

**291. Special Problems.** Selected problems in the field of journalism including projects in advertising, agricultural and home economics journalism, editorial work, photography, high school journalism, publicity, and radio. I; 2 to 3. Prerequisite: Senior standing in the School of Journalism and Communications; consent of instructor. STAFF.

**292. Special Problems.** Continuation of Journalism 291. II; 2 to 3. Prerequisite: Senior standing in the School of Journalism and Communications; consent of instructor. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**308. High School Journalism.** Journalistic writing in the high school; newspaper study and training of newspaper readers; supervision of school publications and publicity; junior college courses in journalism. II; 3 hours, or ½ unit. Prerequisite: Education 109, or consent of instructor. BROWN.

**309. Public Relations.** Publicity methods and public relations; representation of business and other sponsors to the public and representation of the public to employers. Preparation of public relations units for the press and other media. I; 2 hours, or ½ unit. Prerequisite: Senior standing in the School of Journalism and Communications, or consent of instructor. MURPHY.

**310. Press Systems of the World.** Press of England, France, Germany, Italy, Russia, Latin America, China, and Japan; international organization of the press. II; 2 hours, or ½ unit. BARLOW.

**311. Newspaper Law.** Freedom of the press; the right to gather, publish, and comment on the news. I, II; 3 hours, or ½ unit. TREBILCOCK.

**320. Editorial Studies and Writing.** Writing of editorials and preparation of editorial judgments. Policies for editorials and for the editorial page. I; 3 hours, or ½ unit. Prerequisite: Journalism 212; senior standing in the School of Journalism and Communications. BARLOW.

**321. Copyreading.** Newspaper desk work; editing the news; correction of faulty news stories; handling wire copy. Attention to head-writing, news pictures, makeup and design of newspaper pages. I, II; 4 hours, or 1 unit. Prerequisite: Credit or registration in Journalism 204; Journalism 212. RAE.

**323. Advanced Reporting.** Advanced types of news investigation and treatment. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 212, or equivalent. TREBILCOCK.

**328. Industrial Publications.** Problems and techniques of editing house organs. II; 2 hours, or ½ unit. Prerequisite: Journalism 211 or 227. PETERSON.

**343. Newspaper Circulation Problems.** Study of the promotion, sales, distribution, and administration problems of the circulation departments of weekly and daily newspapers. II; 3 hours, or ½ unit. Prerequisite: Journalism 241. RAE.

**351. Graphic Production Processes.** Detailed study of the preparation of copy and illustrative material for the mass production of news, features, and advertising; comparison of quality and costs of production processes; consideration of personnel, equipment, and raw materials entering into graphic production. Field trips to Danville and Chicago; estimated expense, $15. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 204. SEIL.

**362. Radio Station Management.** A study of the organization and administration of the radio staff and station; public relations, personnel management, and station operations; analysis of station and agency relationships and radio sales procedure; methods and media for program and station promotion; law and regulations affecting management, financing, and labor relationships. II; 2 hours, or ½ unit. Prerequisite: Journalism 261; senior standing. SCHOOLEY.

**365. Radio News.** News writing and editing for broadcasting; radio news style; preparation and practice for special event reporting; commentaries and interpretations; radio news services, and processing radio news service copy. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 212. BROWN.

**366. Advanced Radio Practices I.** Project work for advanced students in selected areas of radio, including radio news, radio advertising, radio announcing, radio production and direction, radio writing. I; 2 hours, or ½ unit. Prerequisite: All courses in area of specialization; consent of instructor. HUDSON and others.

**367. Advanced Radio Practices II.** Project work for advanced students in selected areas of radio, including radio news, radio advertising, radio announcing, radio production and direction, radio writing. II; 2 hours, or ½ unit. Prerequisite: All courses in area of specialization; consent of instructor. HUDSON and others.

**368. Radio and Television Regulation.** Federal legislation, with emphasis on the Communications Act of 1934 and the regulations of the Federal Communications Commission, legal problems in program operations, censorship and editorial selections, copyright, and author-producer relations. II; 2 hours, or ½ unit. SIEBERT.

**382. Advertising Copy and Layout.** Same as Marketing 382. Theory and practice of advertising copy writing and layout for newspaper, magazine, and direct mail. Advertising planning for the local advertiser. Use of consumer and market surveys, copy-testing methods, and advertising readership studies. I, II; 4 hours, or 1 unit. Students will not be given credit toward graduation for both Journalism 382 and 282. Prerequisite: Journalism 281, or Marketing 281; Journalism 204. SARGENT and others.

**383. Advertising Media.** Same as Marketing 383. Analysis of the various advertising media in terms of markets served and factors to consider in the selection of media. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281, or Marketing 281. FRYBURGER.

**384. Advertising Campaigns.** Same as Marketing 384. Planning and execution of an advertising campaign; market and consumer research; development and allocation of advertising budget; organization and functions of advertising agency; choice of advertising appeals; selection of media; preparation of advertisements—copy and layout. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 382 or 282, and 383. Graduate students may not receive credit for both Journalism 384 and 387. WEDDING.

**385. Advertising Promotion and Sales.** Same as Marketing 385. Sales problems, advertising promotion, advertising research, market research. I, II; 3 hours, or ½ unit. Prerequisite: Journalism 281 or Marketing 281. MCCLURE.

**386. Radio and Television Advertising.** Same as Marketing 386. Economics, standards, and ethics as applied to radio and television commercials; sponsorship, rates, and advertising techniques, including merchandising, marketing, servicing, and sales; preparation and presentation of radio and television advertising copy, measurements, and listener surveys. I, II; 2 hours, or ½ unit. Prerequisite: Journalism 281, or Marketing 281. FRYBURGER.

**387. Advertising Policies and Problems.** Same as Marketing 387. Analysis of actual advertising situations and study of how such situations were or might have been met. Consideration given to management and technical problems at both the national and retail levels. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Journalism 281, or Marketing 281. Graduate students may not receive credit for both Journalism 384 and 387. WEDDING.

**390. Economics of Communications I.** Same as Economics 390. Economic problems associated with the various forms of radio broadcasting including FM, television, and facsimile, and the use of radio for the safety and efficiency of transportation, protective services, etc. I; 3 hours, or ½ to 1 unit. Prerequisite. Economics 102 and 103, or 108. SMYTHE.

**391. Economics of Communications II.** Same as Economics 391. Economic problems associated with the following means of communication: motion pictures, newspapers, magazines, and books. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. SMYTHE.

## LABOR AND INDUSTRIAL RELATIONS

*Professors:* M. DERBER (Acting Director of Institute of Labor and Industrial Relations), W. E. CHALMERS, P. L. GARMAN, E. B. MCNATT, W. H. MCPHERSON, L. L. MCQUITTY, R. STAGNER, R. N. SULLIVAN.
*Associate Professors:* R. DUBIN, O. H. ERICKSON, C. B. HAGAN, J. F. HUMES, F. MEYERS, J. B. PARRISH, L. C. PIGAGE, E. C. WOLFE.
*Assistant Professors:* J. M. BRUMM, MARGARET K. CHANDLER, M. EDELMAN, H. L. GAMMILL, S. B. LEVINE, R. E. MCCOY, H. ROSEN, R. C. WILCOCK, D. E. WRAY.
*Research Associate:* RUTH A. HUDSON.
*Instructors:* T. PAGE, W. POLNER.
*Research Assistant:* LEONA D'ACQUISTO.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

NOTE: Undergraduates are not allowed to register for Labor and Industrial Relations courses. They may register for the course under its departmental number (economics, psychology, etc.).

**312. Problems of Administration and Organization.** Same as Management 312. Problems of the individual and groups brought about by modern industrial organizations and techniques. Motivations for work and cooperation between executives and different economic and social groups. I, II; 3 hours, or ½ unit. Prerequisite: Management 101, or equivalent. DUBIN.

**318. Human Relations in Industry.** Same as Sociology 318. Sociology of industry and problems of personal adjustment. The emergence of modern industrial and labor organizations and their impact upon community life. I, II; 3 hours, or ½ unit. Prerequisite: Senior standing; Psychology 100; Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, or consent of instructor. CHANDLER, WRAY.

**342. Economics of Social Security.** Same as Economics 342. A critical analysis of the economic issues and problems involved in our legislative efforts to reduce the economic risks of unemployment, old age dependency, and industrial injury. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108. MCNATT.

**343. The Labor Market.** Same as Economics 343. Economic analysis of the labor market, its structure, characteristics, and operations in contrast with other markets; factors making for equilibrium and disequilibrium; migration; occupational and industrial mobility; labor market research including techniques and materials. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 or 108; Economics 240. PARRISH.

**344. The Law and Labor.** Same as Economics 344. An economic analysis of the problems and issues arising out of the legislative and judicial efforts to define the rights, duties, and responsibilities of labor organizations and management in the field of industrial relations. II; 3 hours, or ½ to 1 unit. Prerequisite: Economics 102 and 103, or 108; Economics 240. McNatt.

**346. Foreign Labor Movements.** Same as Economics 346. Analysis of the history, organization, economic policies, political programs, and domestic, international, and contemporary influence of the labor movements of Great Britain, Sweden, Germany, France, Latin America, and Russia. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 240. Chalmers.

**347. Labor Law.** Same as Law 347. The law of industrial relations with special emphasis on recent cases and legislation; collective bargaining and labor contracts; wages and hours legislation; unemployment compensation. I or II; 3 hours, or 1 unit. Sullivan.

**357. Psychology of Industrial Conflict.** Same as Psychology 357. An analysis, in terms of the behavior of individuals, of the causes and possible solutions of industrial conflict. Motives, emotions, attitudes, and ways of perceiving situations are considered in relation to the actions of industrial executives, factory workers, and union leaders. Results of factory observation, public opinion polls, laboratory experimentation, and psychoanalysis are integrated to provide a systematic interpretation of the problem, and to evaluate proposed actions toward a solution. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100, or equivalent; Psychology 145, or Economics 240, or Sociology 318. Stagner.

**365. Theory and Administration of Federal Labor Law.** Same as Political Science 365. Critical analysis of the relationship between group pressures on government and public policy affecting labor; role of administration in formation of policy; problems and experience of federal agencies operating in the labor field. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. Edelman.

**368. Public Personnel Administration.** Same as Political Science 368. An analysis of personnel management in government. Recruitment and selection, job and salary classification, work standards, training, and the role of labor and professional organizations in the public services considered in the light of current theory and practice. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 361, or consent of instructor. Page.

**376. Statistics of Labor.** Same as Economics 376. A study of the methods and problems involved in the derivation of "labor statistics" from both the theoretical and practical points of view. The statistical aspects of the measurement, analysis, and interpretation of data on wages, employment, labor force, and productivity are stressed. I; 3 hours, or ½ to 1 unit. Prerequisite: Economics 170, or equivalent.

## LANDSCAPE ARCHITECTURE

*Professors:* O. G. Schaffer (Head of Department), H. Bartholomew, K. B. Lohmann, D. H. Morgan, Florence B. Robinson (Emerita), S. H. White.
*Assistant Professors:* J. A. Edsall, V. A. Hyde, W. Keith, I. L. Peterson.
*Assistant:* B. B. Taylor.

### COURSES FOR UNDERGRADUATES

**111. History of Landscape Architecture.** Lectures, reference readings, library sketches, and reports. Required of freshmen in the professional course; open to other students with consent of instructor. I; 3. Peterson.

**132. Elements of Landscape Architecture.** Delineation of landscape forms, drafting, lettering, wash rendering, color and color harmony, elementary composition. II; 3. Students with 95 or more credit hours receive only 2 hours credit. Taylor, White.

**133. Elementary Landscape Design.** Principles of landscape composition, elements of the natural landscape, types of drafting. Lectures, reference readings, plan work, and field trips. I; 3. Prerequisite: Landscape Architecture 131 and 132. TAYLOR.

**134. Elementary Landscape Design.** Principles of landscape composition, elements of the natural landscape, types of drafting. Lectures, reference readings, plan work, and field trips. II; 3. Prerequisite. Landscape Architecture 131 and 132. TAYLOR.

**164. Appreciation of Landscape Architecture.** An introduction to the relationship of landscape practice to present-day life and living. For non-professional students only. II; 3. Prerequisite: Sophomore standing. PETERSON.

**174. Regional Planning.** Interrelationships and planned arrangements of regions and groups of regions; metropolitan, county, state and national planning. II; 3. Prerequisite: Sophomore standing. LOHMANN and others.

### COURSES FOR ADVANCED UNDERGRADUATES

**213. Development and Theory of Contemporary Landscape Architecture.** Influences which affected landscape design from the nineteenth century to the present and analysis of contemporary theories of landscape design. I; 3. Prerequisite: Junior standing in landscape architecture or consent of instructor. WHITE.

**235. Design of Recreational Areas.** Same as Recreation 235. Analysis and study of planning standards for recreational areas. I; 2 or 4. Prerequisite: Landscape Architecture 134, or junior standing in recreation.

**236. Intermediate Landscape Design.** Gardens, estates, playgrounds, and small parks. Lectures, readings, written reports, sketching and plan work, field trips. II; 4. Prerequisite: Landscape Architecture 235. KEITH.

**237. Advanced Landscape Design.** Public and semi-public properties, schools, rural parks, golf courses, and cemeteries. I; 5. Prerequisite: Landscape Architecture 236. WHITE.

**238. Advanced Landscape Design.** Public and semi-public properties; schools, rural parks, golf courses, and cemeteries. II; 5. Prerequisite: Landscape Architecture 237. WHITE.

**243. Landscape Construction.** Beginning course. Elements of grading, profiles and cross sections, water distribution, specifications, working drawings and reports. I; 3. Prerequisite: Civil Engineering 117 and 118. SCHAFFER.

**244. Landscape Construction.** Beginning course. Elements of grading, profiles and cross sections, water distribution, specifications, working drawings and reports. II; 3. Prerequisite: Civil Engineering 117 and 118. KEITH, SCHAFFER.

**246. Office Practice.** Professional ethics and methods of practice. Professional charges. Landscape contracts and specifications. II; 2. Prerequisite: Landscape Architecture 237. SCHAFFER.

**248. Advanced Landscape Construction.** Advanced problems relating to landscape construction: grading, drainage, road building, walks, retaining walls, foot bridges, culverts, cost estimates. The course is concerned with general layouts rather than with structural design. II; 3. Prerequisite: Landscape Architecture 243 and 244. SCHAFFER.

**251. Trees and Shrubs.** Identification and landscape characteristics of trees, shrubs, evergreens, and vines. Open only to landscape architecture and floriculture students. I; 3. Prerequisite: Botany 100. KEITH.

**252. Trees and Shrubs.** Identification and landscape characteristics of trees, shrubs, evergreens, and vines. Open only to landscape architecture and floriculture students. II; 3. Prerequisite: Botany 100. KEITH.

**253. Planting Design.** Color charts, fundamentals of planting composition. Plans, sketches, and models. I; 4. Prerequisite: Landscape Architecture 236, 251, and 252. WHITE.

**254. Planting Design.** Color charts, fundamentals of planting composition. Plans, sketches, and models. II; 4. Prerequisite: Landscape Architecture 253. WHITE.

**255. Care of Plant Materials.** Elements of planting practices, pruning, soil preparation, insect pests, tree surgery. I; 2. Prerequisite: Landscape Architecture 236 and 252. SCHAFFER.

**272. Planning of Towns and Cities.** Development of communities: the city plan and its elements; zoning. Open to students in other departments. Inspection trip required of all landscape architecture students but optional for others. I, II; 3. Prerequisite: Junior standing. BARTHOLOMEW, LOHMANN.

## LAW

*Professors:* A. J. HARNO (Dean of College of Law), W. E. BRITTON, K. S. CARLSTON, E. W. CLEARY, R. G. COHN, A. F. CONARD, G. W. GOBLE, F. GREEN (Emeritus), H. W. HOLT, R. F. LESEMANN, O. L. MCCASKILL (Emeritus), M. I. SCHNEBLY, R. N. SULLIVAN, W. L. SUMMERS, J. G. THOMAS, G. B. WEISIGER.
*Associate Professors:* J. E. CRIBBET, J. N. YOUNG.
*Assistant Professors:* C. H. BOWMAN, R. J. FALETTI.
*Participating from Other Departments:* C. M. KNEIER.

### PROFESSIONAL COURSES

**301. Contracts A.** Offer and acceptance, consideration, seals, Statute of Frauds. I, II; 3. FALETTI, GOBLE.

**302. Contracts B.** Third party beneficiaries, assignment, conditions, impossibility, anticipatory repudiation, and discharge; contract and quasi-contract distinguished, and measure of damages for each. I or II; 3. Prerequisite: Law 301. GOBLE.

**303. Torts A.** Trespass, conversion, negligence. I, II; 3. WEISIGER.

**304. Torts B.** Defamation, disparagement of property, fraud, absolute liability, and torts requiring intentional invasions of various interests. I or II; 3. Prerequisite: Law 303. WEISIGER.

**305. Judicial Remedies.** Common-law forms of action, extraordinary legal remedies, equitable remedies, abolition of the forms of action, the merger of law and equity. I or II; 4. CRIBBET.

**306. Agency and Employment.** The liabilities of employers: vicarious liability for tort; statutory liabilities for workmen's compensation, minimum wages, and social security taxes. The powers of agents to contract on behalf of their principals, and the liabilities of principals and agents to each other. I or II; 3. CONARD.

**308. Estates in Land.** Feudal tenures; seisin and possession; common-law estates and nonpossessory interests in land; Statute of Uses; creation of estates, fee simple, fee conditional, fee tail, determinable fees, life estates, estates for years, concurrent estates; modes of conveyance at common law, under Statute of Uses, and under modern statutes. I or II; 2. SUMMERS.

**309. Criminal Law.** The sources and purposes of the criminal law; the meaning of criminal responsibility; the characteristics of particular crimes. I or II; 3. HARNO.

**310. Constitutional Law.** The apportionment of governmental power between the United States and the states, and the limitations on power resulting from the contract, equal protection, and due process clauses. I or II; 3. SULLIVAN.

**315. Legal Writing A.** Critical and intensive training in the use of legal language; exposition of legal and related materials, with emphasis on individual assignments. I; 2. COHN, FALETTI.

**316. Legal Writing B.** Continuation of Law 315. II; 1. COHN, FALETTI.

**320. Wills and Administration.** Making, revocation, revival, and republication of wills; descent; administration of estates. I or II; 3. FALETTI, SCHNEBLY.

**321. Bills and Notes.** Formal requisites of negotiability of bills; checks and notes; methods of transfer; bona fide purchase; rights and liabilities of parties. I or II; 3. BRITTON, HOLT.

**322. Vendor and Purchaser.** The real estate contract: Statute of Frauds, performance of the contract, marketable title, rights of parties pending transfer of title, equitable conversion, remedies, and assignment of real estate contracts. I or II; 2. CRIBBET.

**323. Administrative Law.** The functions of administrative tribunals in federal, state, and municipal government, the procedure before such administrative tribunals, and judicial relief from administrative decisions. I or II; 3. SULLIVAN.

**324. Business Associations.** Partnerships, corporations, and other types of business organization; how they are formed, and what rights and liabilities result. Exercises in planning business organizations and drafting documents. I or II; 3. CONARD.

**325. Pleading.** Formation of issues and exchange of information in advance of trial. I or II; 3. CLEARY.

**326. Evidence.** Principles governing the admission of evidence and the competency of witnesses. One hour each week is devoted to practice exercises. I or II; 4. CLEARY.

**327. Titles.** Adverse possession; prescription; execution of deeds; signing, sealing, acknowledgment, delivery, acceptance; subject matter, boundaries, accretion, exceptions and reservations; creation of easements by implication; covenants for title; estoppel by deed; priorities and recording systems. I or II; 2. SUMMERS.

**328. Federal Taxation.** Federal income tax: constitutional background; what constitutes income as distinguished from gifts, etc.; whose income it is in relation to benefits and control; when is income realized or expense deductible; when does income arise in connection with corporate distributions and reorganizations; capital gains and losses; deductions and credits; special problems relating to classes of taxpayers. Federal estate and gift taxes and brief reference to state inheritance taxes. General problems of tax practice and procedure. I or II; 3. YOUNG.

**329. Trusts.** A study of the jural relations between trustee and beneficiary, between trustee or beneficiary and third persons, and between successive beneficiaries; the rules governing the creation of express trusts for private persons, charitable trusts, resulting and constructive trusts; the transfer or extinguishment of the equitable interest; and the termination of the trust. I or II; 4. SCHNEBLY.

**330. Restitution.** Contractual and quasi-contractual remedies (both legal and equitable) available because of duress, fraud, innocent misrepresentation, mistake, illegality, and economic compulsion in the formation and discharge of contracts and other transactions. I or II; 3. CARLSTON.

**331. Legislation.** A study of legislative policies and procedures, of legislation as a source of law, of types of statutes, their structure, and of the problems of interpretation. I or II; 3. COHN.

**332. Rights in Land.** Natural rights, profits, licenses, easements, covenants, rents, and waste. I or II; 3. SUMMERS.

**333. Persons.** Marriage, separation, and divorce, property rights of married women, contractual and tort liabilities of one spouse to the other and to third persons. I or II; 2. CARLSTON.

**334. Criminal Law Administration and Procedure.** Problems in the administration of the criminal law. A study of criminal procedure from arrest to the end of the prosecution in a court of review, with emphasis on procedure as a device for social regulation, and including an appraisal of aims and workings of probation, parole, and executive clemency. I or II; 2. HARNO.

335. **Trials and Appeals.** Litigation from process through appeal, excluding pleading and evidence. I or II; 3. Bowman.

336. **Use of Law Books.** Practice in the library in the use of statutes, reports, digests, encyclopedias, annotated cases, citation books, reference tables, indices, and textbooks. I or II; 1. Weisiger.

337. **Sales.** A study of rights and duties of parties under contracts relating to the sale of chattels, including the following problems and topics; transfer of the property interest in the subject matter of the contract; acquisition of property rights by third persons in the subject matter of the contract—estoppel and fraud; negotiable documents of title; conditional sales; trust receipts; performance of the contract; risk of loss; warranties; remedies of buyer and seller. I or II; 3. Britton.

338. **Insurance.** Personal and property insurance: formation of the insurance relation; concealment, warranties, representations; insurable interest; conditions; subrogation; waiver and estoppel; incontestability, the respective interests of the beneficiary, insured, insurer, assignee, and creditor, and facts constituting maturity in life, accident, fire, theft, liability, and collision policies. I or II; 3. Goble.

339. **Conflict of Laws.** Problems from conflict of laws in jurisdiction of courts; foreign judgments; torts and workmen's compensation acts; contracts; sales and mortgages; family law; administration of estates; business organizations. I or II; 4. Holt.

340. **Municipal Corporations.** Creation and organization; powers; liability on contracts and in tort; property rights; revenue and indebtedness. I or II; 2. Kneier.

341. **Oil and Gas.** Nature of the property interests in oil and gas; legal interests created by oil and gas leases; validity of leases; the habendum clause; the drilling and rental clauses; assignments of the interest of the lessor and the lessee; rents and royalties. I or II; 2. Summers.

342. **Mortgages.** A study of chattel and real estate mortgages, and conditional sales. I or II; 3. Holt.

343. **Public Utilities.** Obligations of public utilities to serve without discrimination; reasonable rates; duty to extend facilities; the liability of the carrier of passengers and freight. I or II; 2. Faletti.

344. **Creditors' Rights.** Remedies of the delinquent debtor and his creditors—at law, in equity, and under the Bankruptcy Act; liquidation and rehabilitation; exercises in bankruptcy procedures. I or II; 3. Bowman.

345. **Suretyship.** Suretyship, guaranty, and the accommodation contracts of negotiable instruments. I or II; 2. Holt.

346. **Future Interests and Restraints Upon Alienation.** A study of the various types of future interests in real and personal property recognized by law, and of the rules which determine the validity and effect of future limitations; of restraints upon the alienation of property interests; and trusts for the accumulation of income. I or II; 4. Prerequisite: Law 329. Schnebly.

347. **Labor Law.** Same as Labor and Industrial Relations 347. The law of industrial relations with special emphasis on recent cases and legislation; collective bargaining and labor contracts; wages and hours legislation; unemployment compensation. I or II; 3. Sullivan.

348. **International Law.** A study of special phases of international law, including its nature, sources, and subjects; jurisdiction and territory; law of treaties; treatment of aliens and law of international claims; pacific settlement of international disputes; and current developments. I or II; 3. Carlston.

349. **State and Local Taxation.** Proper and improper purposes of taxation. General property tax and tax administration: levy, return, assessment; various problems of assessment; collection of taxes and taxpayers' remedies. Excise taxes: general nature; ex-

cise tax on business concerns and transactions. Jurisdiction for purposes of general property and death taxes. I or II; 2. YOUNG.

**350. The Legal Profession.** A study of the traditions and ethics of the bar with special reference to modern controversies. I or II; 1. HARNO.

**351. Jurisprudence.** Nature of the law, legal methods, and the judicial process; review of the various theories of law and schools of jurisprudence and philosophy of the law; relation of law and social science. I or II; 3. CARLSTON.

**353. Corporation Finance.** Methods of financing corporations, as affected by corporation laws, securities regulation, and tax burdens. Research projects on various problems in the field of business organization. I or II; 3. CONARD.

**355. Trade Regulation.** Problems of the businessman, common-law restraint of trade, anti-trust laws, fair trade practices, trademarks, price discrimination, Federal Trade Commission. Emphasis will be placed upon the technique of handling problems in this field. I or II; 3. CARLSTON.

**360. Legal Drafting and Office Practice.** A practical course on the drafting of legal documents; a study of the organization and management of a law office. I, II; 2. BRITTON, THOMAS.

**361. Problems and Procedures in Office Practice.** A practical course in preparation for negotiations, office conferences, and settlement procedures, with emphasis on particular areas of the practice. I or II; 2. STAFF.

**362. Practice Court.** Practice work in the conduct of litigation. Actual courtroom conditions are simulated. II; 2. CLEARY.

**363. Probate Practice.** Consideration of the more common steps in probate proceedings, with practice in the use of forms and court appearances. I or II; 1. BOWMAN.

**371. Seminar: Commercial Paper.** Problems in commercial paper; a study of commercial paper with emphasis on the integration of the various business transactions that are related thereto and on the impact of legal sanctions on these transactions. The course involves a critical study of the Uniform Commercial Code. I or II; 2. BRITTON.

**372. Seminar: Problems of Business Organization.** Study of cases and statutes in various fields of business organization, accompanied by the execution of individual research projects related to the field of study. I or II; 2. CONARD.

**373. Seminar: The Legislative Processes.** Analysis of the legislative processes in the Congress and the state legislatures, the growth of statutory law; assigned problems for individual research and bill-drafting, with emphasis on the development of professional skills in this field. I or II; 2. COHN.

**374. Seminar: Federal Taxation Problems I.** Tax problems relating to the form of business organization, business operations, and various business and investment transactions. Research projects on related problems. I; 2. Prerequisite: Law 328. YOUNG.

**375. Seminar: Federal Taxation Problems II.** Income, estate, and gift tax problems in estate planning and estate administration, including the operation of trusts; appraisal of estate and gift tax system and study of proposals to integrate the federal income, estate, and gift taxes. Research projects on related problems. II; 2. Prerequisite: Law 328. YOUNG.

**391. Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. CRIBBET.

**392. Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. Prerequisite: Law 391. CRIBBET.

**393. Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. Prerequisite: Law 392. CRIBBET.

394. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. Prerequisite: Law 393. CRIBBET.

395. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. Prerequisite: Law 394. CRIBBET.

396. **Legal Problems.** Preparation of comments on recent decisions for publication in the University of Illinois *Law Forum*. Open to students selected for superior achievement in two or more semesters of law study. I, II; 1. Prerequisite: Law 395. CRIBBET.

399. **Research in Special Topics.** Individual research on a special problem selected in consultation with the instructor. I, II; 1 to 4.

## LIBRARY SCIENCE

*Professors:* R. B. DOWNS (Director of Library School), ANNE M. BOYD (Emerita), L. W. DUNLAP, A. H. LANCOUR, E. J. REECE (Visiting), P. L. WINDSOR (Emeritus).
*Associate Professors:* L. E. BAMBER, ETHEL BOND (Emerita), THELMA EATON, FRANCES B. JENKINS, ROSE B. PHELPS, FRANCES SIMPSON (Emerita).
*Assistant Professors:* MARIE M. HOSTETTER, M. ALICE LOHRER, C. W. STONE.
*Instructors:* DONNA D. FINGER, VIOLA JAMES.
*Assistants:* JULIETTE BRYSON, ANN L. CAMPO, EVALYN W. MILES, RONALD C. TOLLAFIELD, ROSE VAINSTEIN.

### COURSES FOR UNDERGRADUATES

195. **Introduction to Library Use.** Use of the card catalog, periodical indexes, encyclopedias and dictionaries, and other reference books. Intended for freshmen and sophomores; not for students in the Library School. I, II; 2.

### COURSES FOR ADVANCED UNDERGRADUATES

201. **Use of Books and Libraries.** This course presents practical information on the use of the classification and the card catalog, printed indexes, bibliographies, and reference books, and is designed to teach the students to use books and libraries intelligently and skillfully. I; 3. PHELPS.

204. **Organization and Operation of Libraries I.** Designed to give the student an understanding of the basic functions of the modern library, from the point of view of the professional librarian. The functions of supervising library operations and services are considered. II; 3. JENKINS.

255. **Organization and Operation of Libraries II.** The organization and arrangement of materials in a modern library. Cataloging methods and classification schemes are studied and practiced. I; 3. EATON.

258. **Selection of Library Materials.** This course acquaints the student with the several bibliographical aids to the selection of books, films, and recordings for library collections, with practice in their use. It includes an introduction to the study of the principles governing collection development. I, II; 3. LOHRER.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Literature of the Humanities and Social Sciences.** The purpose of this course is to increase the student's knowledge of the scope and significant characteristics in the literature of the social sciences and the humanities by systematic study of modern trends, themes, and representative materials. Provides an introduction to each field, and emphasizes development of skills in selection in relation to library problems and processes. I; 3 hours, or 1 unit.

**302. Literature of Science and Technology.** A survey of the several fields of pure and applied science and a study of the literature of each field. Designed to give the student an understanding of the content of each of the scientific disciplines and its role and place in modern society. Selected readings from the outstanding works in each field will acquaint the student with the principal sources. II; 3 hours, or 1 unit. JENKINS.

**303. Library Materials for Children.** The selection and use of library materials for children in public and school libraries according to the needs of the child in his physical, mental, and emotional development, and the purposes of the elementary school program. The student becomes acquainted with the standard book selection aids for children and with all types of printed and audio-visual materials, and develops the ability to select and describe children's library materials according to their developmental uses. I, II; 3 hours, or 1 unit. HOSTETTER, LOHRER.

**304. Library Materials for Adolescents.** The selection and use of library materials for adolescents in school and public libraries and community organizations. The course aims to develop the ability to select and evaluate a wide variety of reading materials from standard bibliographies for the adolescent according to his personal and school needs. I, II; 3 hours, or 1 unit. HOSTETTER, LOHRER.

**306. Maps and Cartobibliographical Aids.** An examination of the problems involved in the cataloging, classification, and care of maps. The student will become acquainted with the major cartobibliographical and related aids in the field. II; 2 hours, or ½ unit. WOODS.

**308. Audio-Visual Services in Libraries.** A consideration of the development of audio-visual services in libraries. In class, the student becomes aware of the range, types, and functions of audio-visual materials, equipment, and services provided by libraries, and is introduced to some organizational and technical problems facing the specialist. Separate laboratory sessions give opportunity for developing skills in projection, recording, and similar materials. II; 2 hours, or ½ unit. STONE.

### Management

(See Business Organization and Operation)

### Marketing

(See Business Organization and Operation)

## MATHEMATICS

*Professors:* S. S. CAIRNS (Head of Department), R. BAER, H. W. BAILEY, D. G. BOURGIN, H. R. BRAHANA, R. D. CARMICHAEL (Emeritus), A. B. COBLE (Emeritus), M. M. DAY, J. L. DOOB, B. ECKMANN, A. EMCH (Emeritus), P. W. KETCHUM, H. LEVY, W. G. MADOW, H. J. MILES, A. H. TAUB, E. J. TOWNSEND (Emeritus), W. J. TRJITZINSKY.

*Associate Professors:* H. CHERNOFF, OLIVE C. HAZLETT (on leave), G. P. HOCHSCHILD, C. W. MENDEL, G. E. MOORE, J. P. NASH, J. W. PETERS, L. L. STEIMLEY, H. E. VAUGHAN.

*Assistant Professors:* BEULAH M. ARMSTRONG, W. F. ATCHISON, P. T. BATEMAN, C. R. BLYTH, O. K. BOWER, JOSEPHINE H. CHANLER, W. A. FERGUSON, M. K. FORT, JR., V. A. HOERSCH, F. E. HOHN, J. LANDIN, R. G. LANGEBARTEL, H. LASS, B. E. MESERVE, JOSEPHINE M. MITCHELL, M. E. MUNROE, ECHO D. PEPPER, R. E. PINGRY, I. REINER, L. SCHOENFELD, E. J. SCOTT, D. J. WHEELER, W. WILSON.

*Instructors:* CORINNE HATTAN, C. PHILLIPS, JEWELL E. SCHUBERT.

*Research Associates:* K. T. CHEN, N. T. HAMILTON.

*Assistants:* J. H. ABBOTT, R. BAER, L. C. BUTLER, A. CRONHEIM, M. P. EMERSON, A. V. FEND, J. E. FLANAGAN, H. FLESCH, L. R. FORD, JR., H. H. FOX, D. M. FRIEDLEN,

R. T. Gregory, C. B. Hanneken, D. G. Higman, J. H. Hornback, Elaine Hundertmark, C. L. Keller, C. N. Maxwell, W. A. Michael, Jr., M. W. Milligan, E. R. Mullins, D. A. Page, R. E. Priest, W. G. Rosen, J. U. Russell, F. S. Scalora, E. J. Schweppe, R. J. Silverman, R. W. Sloan, D. L. Sullivan, S. E. Walkley, M. J. Walsh.

### MAJOR IN MATHEMATICS

**Major:** Twenty hours in mathematics, excluding courses with numbers less than 130 and including two courses chosen from Mathematics 311, 312, 317, 318, 327, 328, 347, 348.

**Minors:** Twenty hours selected from one or two of the following subjects: accountancy, astronomy, chemistry, economics, philosophy, physics, psychology, statistics (Mathematics 161, 361, 362, 363, 364, 371, 372, 375, 376, 377), surveying, theoretical and applied mechanics. If two subjects are chosen, at least eight hours must be taken in each.

Note: For undergraduate students intending to take advanced work or a major in mathematics, the following outline of freshman and sophomore work is suggested: Freshman year: first semester, Mathematics 111 or 112, and 114 or 115; second semester, Mathematics 122. Sophomore year: first semester, Mathematics 132; second semester, Mathematics 142.

Students preparing to teach high school mathematics should consult with Dr. J. W. Peters, 253 Mathematics Building, concerning their programs at the earliest possible moment on entering the University.

### MAJOR IN STATISTICS

**Major:** Twelve hours beyond the calculus including Mathematics 315, 347, 363, and three other hours of 300 courses in statistics in the Department of Mathematics.

**Minor:** Twenty hours in an area of application of statistics. Of these twenty hours not more than nine can be in statistical methods, and Mathematics 161 may be taken as three of these hours. The courses not emphasizing statistical methods should be chosen so that courses on the 400 level can be taken if the student enters graduate work.

### COURSES FOR UNDERGRADUATES

**101. Basic Mathematics.** A systematic presentation of the fundamentals of arithmetic, algebra, plane geometry, trigonometry, and statistics. Required of students in the general curriculum of the College of Liberal Arts and Sciences whose entrance credits do not include one year of algebra and one year of plane geometry. I, II; 3.

**102. Basic Mathematics.** Continuation of Mathematics 101. I, II; 3. Prerequisite: Mathematics 101.

**104. Elements of Algebra and Trigonometry.** For premedical students who have entered with only one unit of high school algebra and who need credit in trigonometry as a prerequisite to physics. This course does not serve as a prerequisite for Mathematics 122. Premedical students who enter with 1½ units of algebra must take Mathematics 114. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: High school algebra, 1 unit; plane geometry, 1 unit.

**106. Solid Geometry.** Satisfies deficiency in solid geometry for engineering students; all other students receive full credit. I, II; 3. Prerequisite: Entrance algebra, 1 unit; plane geometry, 1 unit.

**111. Algebra.** I, II; 5. Students having 1½ entrance units in algebra receive only 3 hours credit. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Entrance algebra, 1 unit; plane geometry, 1 unit.

**12. College Algebra.** I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

**14. Plane Trigonometry.** I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Entrance algebra, 1½ units, or registration in Mathematics 111; plane geometry, 1 unit.

**15. Advanced Trigonometry.** Intended for students having entrance credit in trigonometry. The course will include such topics as trigonometric equations, De Moivre's theorem, complex numbers with applications to more complicated problems in plane trigonometry, and a brief introduction to spherical trigonometry. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit; solid geometry, ½ unit; Mathematics 114, or entrance trigonometry, ½ unit.

**17. Combined Freshman Mathematics.** A combined course integrating all the usual topics of algebra, trigonometry, and analytic geometry, and also some topics of differential calculus. For students of architecture, chemistry, chemical engineering, ceramic engineering, and ceramics. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Entrance algebra, 1½ units; plane geometry, 1 unit.

**22. Analytic Geometry.** Plane and solid analytic geometry. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Mathematics 111 or 112, and 114 or 115.

**23. Analytic Geometry.** Plane and solid analytic geometry. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Prerequisite: Mathematics 111 or 112, and 114 and 115.

**27. Combined Freshman Mathematics.** Continuation of Mathematics 117. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Mathematics 117.

**32. Calculus.** First course for students of mathematics and engineering. I, II; 5. Prerequisite: Mathematics 122.

**33. Calculus.** First course for students of mathematics and engineering. I, II; 3. Prerequisite: Mathematics 122 or 123.

**37. Calculus.** For students of architecture, chemistry, chemical engineering, ceramics, and ceramic engineering. I; 3. Prerequisite: Mathematics 117 and 127, or consent of department.

**42. Calculus.** Second course for students of mathematics and engineering. I, II; 3. Prerequisite: Mathematics 132.

**43. Calculus.** Second course for students of mathematics and engineering. I, II; 5. Prerequisite: Mathematics 133.

**47. Calculus.** Continuation of Mathematics 137. II; 3. Prerequisite: Mathematics 137.

**61. Statistics.** I, II; 3. Prerequisite: Mathematics 111 or 112; sophomore standing.

**71. Mathematics of Finance.** A study of simple and compound interest, simple and compound discount, annuities, and applications to various problems in finance. II; 3. Prerequisite: Mathematics 132. Offered in alternate years.

### COURSES FOR ADVANCED UNDERGRADUATES

**202. Arithmetic for Teachers.** Open only to students in the curriculum in elementary education. Credit is not allowed students in the College of Liberal Arts and Sciences. I, II; 5. Prerequisite: Senior standing.

**205. Teachers' Course.** I, II; 3. Prerequisite: A year of calculus, or consent of instructor.

**222. Advanced Aspects of Euclidean Geometry.** I, II; 3. Prerequisite: Eighteen hours of mathematics, including Mathematics 132 and 142.

**291. Thesis and Reading Course.** I; 2. Prerequisite: Twenty-four hours of college mathematics. STAFF.

**292. Thesis and Reading Course.** II; 2. Prerequisite: Twenty-four hours of college mathematics. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Fundamental Concepts of Mathematics.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**302. Fundamental Concepts of Mathematics.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**303. Foundations of Mathematics.** The process of proof applied to some fundamental domains of mathematics, and a discussion of recent criticisms of the foundations of mathematics. I; 3 hours, or 1 unit. Prerequisite: Major in mathematics, or consent of instructor. VAUGHAN.

**304. Foundations of Mathematics.** Continuation of Mathematics 303. The process of proof applied to some fundamental domains of mathematics, and a discussion of recent criticisms of the foundations of mathematics. II; 3 hours, or 1 unit. Prerequisite: Mathematics 303. VAUGHAN.

**311. Advanced Algebra.** For students interested in actuarial science, statistics, or teacher training in mathematics. I; 3 hours, or 1 unit. Prerequisite: Mathematics 142, or consent of instructor.

**312. Advanced Algebra.** For students interested in actuarial science, statistics or teacher training in mathematics. II; 3 hours, or 1 unit. Prerequisite: Mathematics 142, or consent of instructor.

**315. Linear Transformations and Matrices.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 142.

**317. Introduction to Higher Algebra.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**318. Introduction to Higher Algebra.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 317.

**327. Introduction to Higher Geometry.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142 or 147.

**328. Introduction to Higher Geometry.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 327.

**332. Topological Spaces.** I, II: 3 hours, or 1 unit. Prerequisite: Credit or registration in Mathematics 347.

**333. Combinatorial Topology.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

**341. Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**342. Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 341.

**343. Advanced Calculus.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**345. Differential Equations and Orthogonal Functions.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147.

**347. Introduction to Higher Analysis: Real Variables.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343, or consent of instructor.

**348. Introduction to Higher Analysis: Complex Variables.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 347.

**349. Introduction to Higher Analysis: Real Variables II.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 347.

**353. Elementary Theory of Numbers.** I; 3 hours, or 1 unit. Prerequisite: Credit or registration in Mathematics 317 or 347.

**354. Elementary Theory of Numbers.** Continuation of Mathematics 353. II; 3 hours, or 1 unit. Prerequisite: Mathematics 317 or 353.

**358. Mathematics for Social Scientists.** This course will present the topics of the differential and integral calculus that are most important for students of the social sciences and will use exercises drawn from those fields. Some topics from trigonometry and analytic geometry will also be included. I, II; 3 hours, or ½ unit. Prerequisite: Mathematics 111 or 112.

**359. Mathematics for Social Scientists.** Description the same as for Mathematics 358. I, II; 3 hours, or ½ unit. Prerequisite: Mathematics 358.

**361. Theory of Probability.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147. MUNROE.

**362. Finite Differences.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142. Offered in 1952-1953 and in alternate years. PETERS.

**363. Advanced Statistics.** Probability and statistical inference. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142.

**364. Advanced Statistics.** Probability and statistical inference. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 363.

**366. Theory of Sample Surveys.** The development of the formulae to be used in the efficient planning of sample surveys and the interpretation of the results. I, II; 3 hours, or 1 unit. Prerequisite: Differential and integral calculus and a first course in statistics. MADOW.

**367. Practice of Sample Surveys.** Training in planning and making sample surveys; how the results are interpreted. One or more sample surveys will be planned in detail. I, II; 3 hours, or 1 unit. Prerequisite: Differential and integral calculus and a first course in statistics. MADOW.

**369. The Ideas and Methods of Statistics.** The modern formulation of the ideas of statistical inference with applications to the testing of various statistical hypotheses. The treatment will stress not the details but the general nature of proofs. The interpretation of the ideas in practice will be given. I, II; 3 hours, or 1 unit. Prerequisite: Differential and integral calculus and a first course in stastistics. MADOW.

**370. The Ideas and Methods of Statistics.** Continuation of Mathematics 369. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 369, or consent of instructor. MADOW.

**371. Actuarial Theory.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 132 and 142, or 137 and 147. PETERS.

**372. Actuarial Theory.** II; 3 hours, or 1 unit. Prerequisite: Mathematics 371. PETERS.

**375. Nonparametric Inference.** Nonparametric tests of hypotheses concerning means, variances, regression, and correlation coefficients. Methods depending on ranks. The efficiency of nonparametric tests. I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 361 or 363.

**376. Parametric Inference.** Introduction to the theories of estimation, testing hypotheses, and decision functions with respect to the parameters of distributions. The contribu-

tions of R. A. Fisher, J. Neyman, and A. Wald. The theory of the characteristi function will be introduced as needed. I; II; 3 hours, or 1 unit. Prerequisite: Math matics 361 or 363.

377. **Sequential Inference.** An introduction to quality control, sampling, inspection, a sequential analysis with particular emphasis on the latter; control charts; singl double, and multiple sampling inspection methods; sequential probability ratio tes efficiency of sequential tests; expected number of observations necessary; operati characteristics and average sample number curves. I, II; 3 hours, or 1 unit. Pr requisite: Mathematics 363.

381. **Vector and Tensor Analysis.** I; 3 hours, or 1 unit. Prerequisite: Mathematics 142 a 343, or equivalent, or consent of instructor.

382. **Vector, Tensor, and Matrix Methods in Applied Mathematics.** II; 3 hours, or unit. Prerequisite: Mathematics 381, or consent of instructor.

385. **Theory of High-Speed Computing Machines.** The logical design of various types high-speed computing machines. The preparation of problems for such machine I, II; 3 hours, or 1 unit. Prerequisite: Senior standing; consent of instructor.

386. **Laplace Transforms.** I, II; 3 hours, or 1 unit. Prerequisite: Mathematics 343.

387. **Introduction to Numerical Methods.** I or II; 3 hours, or 1 unit. Prerequisite: Math matics 343.

388. **Mathematical Methods in Engineering and Science.** I or II; 3 hours, or 1 uni Prerequisite: Mathematics 343.

389. **Ordinary Non-Linear Differential Equations.** I, II; 3 hours, or 1 unit. Prerequisit Mathematics 343 and 341 or 345.

## MECHANICAL ENGINEERING

*Professors:* N. A. Parker (Head of Department), C. H. Casberg (Emeritus), E. I Broghamer, W. N. Espy, J. R. Fellows, C. W. Ham (Emeritus), J. A. Henr W. L. Hull, S. Konzo, H. H. Korst, D. H. Krans, A. P. Kratz (Emeritus), I Laitala, R. F. Larson, O. A. Leutwiler (Emeritus), E. D. Luke, J. A. Polso (Emeritus), J. H. Potter, D. G. Ryan, H. J. Schrader (cooperating), W. H. Sev erns (on leave), K. J. Trigger, A. C. Willard (Emeritus).
*Associate Professors:* D. H. Cole, L. E. Doyle, C. D. Greffe, G. W. Harper, E. I Hebrank, R. J. Martin, J. C. Miles, L. C. Pigage, C. E. Schubert, F. Seyfarth C. J. Starr, L. M. Zubko.
*Assistant Professors:* H. D. Bareither, J. R. Carroll, B. T. Chao, J. L. Leach, W. Love, C. H. McClay, D. E. McFeron, J. L. Whisenand.
*Instructors:* J. W. Bayne, C. E. Derrough, R. B. Dillaway, G. E. Martin, A. I Noreen (on leave), D. H. Offner, R. H. Page, M. B. Singer, W. F. Stoecker R. P. Strout, A. D. Wright.
*Assistants:* G. M. Cabble, A. O. Davis, W. K. Mueller, M. V. R. Rao.

### COURSES FOR UNDERGRADUATES

171. **Mechanism.** A study of the transmission and modification of motion by linkwork cams, gears, belts, ropes, chains, etc.; theory of gear tooth action; gear tooth system and production methods; point paths; displacement diagrams. I, II; 2. Prerequisite General Engineering Drawing 101; registration in Physics 103. Greffe, Seyfarth

181. **Metal Processing.** Basic machining processes used for metal processing. Use of ma chine tools, jigs, fixtures, gauges, and measuring instruments and inspection method to produce interchangeable metal parts. I, II; 4. Prerequisite: Sophomore standing General Engineering Drawing 101 or 104. Derrough, Doyle, and others.

**182. Manufacturing Processes.** Foundry practice, pattern design; hot and cold forming; welding and allied processes; machine tools and machining practice; use of jigs, fixtures, and tools for manufacture of interchangeable parts. Classroom discussion and demonstration. I, II; 3. Prerequisite: Sophomore standing in aeronautical engineering, or consent of instructor. LEACH, SCHUBERT.

**183. Materials Casting.** Casting as a process of fabrication; the molding process including machine molding; molding sand characteristics, control, and testing; melting and pouring practice. Physical characteristics of cast materials, advantages and disadvantages; gray iron structures and elementary metallurgical concepts; design of wood and metal patterns and correlation with foundry practice; core requirements control and testing. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; sophomore standing. LEACH, SCHUBERT.

**184. Metal Processing.** Basic machining processes used for metal processing. Use of machine tools, jigs, fixtures, gauges, and measuring instruments and inspection methods to produce interchangeable metal parts. I, II; 3. Prerequisite: General Engineering Drawing 101 or 104; sophomore standing. DERROUGH, DOYLE, and others.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Mechanical Power Equipment.** Theory, construction, and operating characteristics of boilers, prime movers, air compressors, fans, and auxiliaries. For civil engineering students. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. DILLAWAY, MILES, and others.

**202. Thermodynamics.** Energy of engineering systems and transformation of energy; properties of thermodynamic media; energy relationships for non-flow and steady-flow processes; power and refrigeration cycles; air compression; and heat transfer. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. LUKE, ZUBKO, and others.

**203. Power Plant Equipment.** Central station equipment including steam generators, steam turbine and engines, internal combustion engines, and auxiliaries. For electrical and general engineering students. I, II; 3. Prerequisite: Mechanical Engineering 202. HEBRANK, MCCLAY, and others.

**204. Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. For chemical engineering students. I, II; 2. Prerequisite: Mechanical Engineering 201; Mechanical Engineering 203, or Chemical Engineering 370. CARROLL, HEBRANK, KRANS, MILES, and others.

**205. Thermodynamics.** Energy and its transformations; properties of thermodynamic systems; non-flow and steady-flow processes of fluids; reversibility and limitations; behavior of gases, liquids, and vapors; entropy and the second law; thermodynamic temperature scales and heat engines. I, II; 3. Prerequisite: Mathematics 142; Physics 103 and 104. BAREITHER, COLE, ESPY, LUKE, and others.

**206. Thermodynamics.** Analysis of steady flow of fluids in pipes, nozzles, orifices, power plant equipment; air compressor, blower, fan and Pitot tube energy relations; detailed analysis of simple steam engines and turbines; power and refrigeration cycles; thermodynamic properties of moist air and applications in air-conditioning processes. I, II; 3. Prerequisite: Mechanical Engineering 205. ESPY, KRANS, LARSON, LUKE, and others.

**207. Power Plant Equipment.** Function and performance of steam power equipment, internal combustion engines, fluid handling equipment, and their auxiliaries. I, II; 3. Prerequisite: Registration in Mechanical Engineering 206. FELLOWS, HEBRANK, HENRY, KRANS, and others.

**208. Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. I, II; 3. Prerequisite: Mechanical Engineering 203, or registration in Mechanical Engineering 206 and 207. BAREITHER, HEBRANK, HENRY, KRANS, and others.

221. **Mechanics of Machinery.** Linkages, cams and gears; belts, ropes, and chains; velocities, accelerations, and inertia forces in machines; vibrations and critical speeds; balancing of engines; principle of the gyroscope. I, II; 5. Prerequisite: Registration in Theoretical and Applied Mechanics 211. RYAN and others.

222. **Mechanics of Machinery.** A study of masses, motions, and forces in machines, with the application of graphical and analytical methods; velocities; accelerations; static forces; inertia forces; balancing; vibrations and critical speeds in shafts; principle of the gyroscope. I, II; 3. Prerequisite: Junior standing in aeronautical engineering. BROCHAMER and others.

223. **Mechanics of Machinery.** A study of masses, motions, and forces in machines, with the application of graphical and analytical methods; velocities; accelerations; static forces; inertia forces; balancing; vibrations and critical speeds in shafts; principle of the gyroscope. I, II; 3. Prerequisite: Mechanical Engineering 171; Theoretical and Applied Mechanics 211 or 156. BROCHAMER and others.

224. **Design of Machine Elements.** Application of the principles of mechanics and physical properties of materials to the proportioning of machine elements, including consideration of function, production, and economic factors. I, II; 3. Prerequisite: Mechanical Engineering 223; Theoretical and Applied Mechanics 221; registration in Theoretical and Applied Mechanics 223. BAYNE and others.

231. **Advanced Metal Processing.** Introduction to the theory of metal cutting and quantity production methods with experiments on machine tool performance, cutting tool analysis, production and specialized machinery, production planning and estimating, and production problems. I, II; 3. Prerequisite: Mechanical Engineering 184; credit or registration in Mechanical Engineering 224. DERROUGH, DOYLE, and others.

232. **Motion and Time Study.** Principles of motion economy affecting design of product, work place layout, and tools and equipment used in manufacture. Necessity for time study and principles of determining time standards. Standard data. Applications for time standards. I, II; 3. Prerequisite: Mechanical Engineering 184; junior standing. PIGAGE.

233. **Industrial Quality Control.** Shewhart control chart techniques, acceptance sampling, rationalization of tolerances and specifications, organization and administration of quality programs. I, II; 3. Prerequisite: Junior standing in engineering. HENRY.

234. **Heat Treatment of Metals.** Effects of heat treatment upon physical properties and structure of metals; heat treating operations; study of structures and physical properties, hardenability, grain size, machinability as affected by structure. Selection and heat treatment of steels based on performance requirements. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 221; registration in Mechanical Engineering 205, 224, and Theoretical and Applied Mechanics 223. MCFERON, TRIGGER, and others.

235. **Industrial Safety.** Detailed study of the principles of industrial and related accident prevention and application. Course is designed to provide a sound working knowledge of safety principles for the student interested in the design or the manufacture of a product and for the student interested in entering the field of safety engineering in industry. I, II; 3. Prerequisite: Junior standing. HARPER.

251. **Mechanical Equipment of Buildings.** Laboratory tests of mechanical equipment such as turbines, fans, boilers, etc. I, II; 1. Prerequisite: Registration in Mechanical Engineering 252; junior standing. CARROLL, FELLOWS.

252. **Heating and Ventilating for Architectural Engineers.** Definition of essential units, use of steam tables, factors affecting human comfort, estimation of heating and cooling loads, study of the various types of warm air, steam, and hot water heating systems. Study of the fundamentals of ventilation and air conditioning; panel heating and automatic controls. I, II; 4. Prerequisite: Registration in Mechanical Engineering 251; junior standing, CARROLL, FELLOWS.

253. **Heating and Ventilating for Architects.** Definition of essential units, use of steam tables, factors affecting human comfort, study of the various types of heating systems,

application and selection of fans, automatic control of heating systems. I, II; 2. Prerequisite: Senior standing. CARROLL, FELLOWS.

**254. Heat Transfer.** Principles and practice of heat transfer, conduction, radiation, natural and forced convection, boiling liquids, condensing vapors, heat exchanger design, insulation, unsteady state heat transfer. I, II; 3. Prerequisite: Mechanical Engineering 202 or 205. HENRY, KRANS, LARSON, ZUBKO.

**255. Mechanical Engineering Laboratory.** Instrumentation and test of mechanical power equipment. Engineering reports. I, II; 3. Prerequisite: Mechanical Engineering 206, 207, and 208. KRANS, STROUT, ZUBKO, and others.

**256. Internal Combustion Engines.** A study of the fundamental principles underlying the theory and analysis of piston-type internal combustion engines. I, II; 3. Prerequisite: Mechanical Engineering 206. HULL, MILES.

**257. Gas Turbines.** A study of the theoretical and design aspects of the components of the combustion gas turbine. I, II; 3. Prerequisite: Mechanical Engineering 234 and 254; Theoretical and Applied Mechanics 232. HULL, LARSON.

**258. Combustion Engine and Turbine Laboratory.** Basic laboratory work in combustion, fuels, lubrication, internal combustion engines, and gas turbines. I, II; 3. Prerequisite: Mechanical Engineering 256. HULL and others.

**259. Refrigeration Engineering.** The theory of operation, design, and selection of mechanical refrigeration equipment; the application of refrigeration systems to industrial cooling. I, II; 3. Prerequisite: Mechanical Engineering 206. KRANS, STOECKER.

**260. Heating, Ventilating, and Air Conditioning.** Heating and cooling loads; hot-water, steam, and warm-air heating, including equipment selection and control of systems; fuels and burners; air-conditioning systems, including equipment selection and processes. I, II; 3. Prerequisite: Registration in Mechanical Engineering 255. CARROLL, FELLOWS, and others.

**261. Heating, Ventilating, and Air-Conditioning Design.** Theory and design of heating, ventilating, and air-conditioning systems. I, II; 3. Prerequisite: Mechanical Engineering 260. CARROLL, FELLOWS.

**271. Design of Machine Elements.** Continuation of Mechanical Engineering 224. I, II; 3. Prerequisite: Mechanical Engineering 224. BROGHAMER, RYAN, SEYFARTH, WHISENAND.

**272. Analytical Design of High-Speed Engines.** Study of the dynamics of high-speed internal combustion engines, engine balance, crankshaft deflections, torsional vibrations. I, II; 3. Prerequisite: Mechanical Engineering 223; senior standing, or consent of instructor. GREFFE.

**273. Machine Design.** Correlation of previously acquired design experience with the creative problem of developing machine parts that depend upon design judgment. I, II; 3. Prerequisite: Mechanical Engineering 271; senior standing, or consent of instructor. RYAN.

**274. Power Plant Design.** A critical study of the functions, relative performance characteristics, economics, selection, and correlation of equipment for a modern power generating station. I, II; 3. Prerequisite: Mechanical Engineering 255. BROGHAMER, GREFFE, RYAN, SEYFARTH.

**281. Manufacturing Organization and Operation.** Basic functions in an industrial organization and their interrelationship. Economic considerations involved in selection of materials, product design, or manufacturing methods to obtain high quality product at minimum cost, on schedule. Production planning and scheduling, materials control and estimating. I, II; 3. Prerequisite: Senior standing in engineering. Credit toward graduation is not allowed for both Mechanical Engineering 281 and Management 101.

**282. Tool Engineering.** Planning and design of special machine tools, jigs, fixtures, dies, gauges, and cutting tools based upon forces, power requirements, tool materials, and

work materials from the standpoint of economical manufacture. I, II; 3. Prerequisite Mechanical Engineering 271. DOYLE and others.

283. **Industrial Plant Design.** Geographical location, layout, and design of industria plants. Materials handling principles and methods. Selection and purchase of equipment. Consideration of safety, service facilities, working conditions. Laboratory work involves major problem in design and layout of industrial plant. I, II; 3. Prerequisite: Mechanical Engineering 232 and 281.

284. **Welding Engineering.** Study of the fundamentals of welding processes and design of weldments. Types, characteristics, and performance of various welding machines and processes; resistance welding and machine welding; inspection and testing of welds; design of weldments based upon suitable size, type, and location of welds; application to the production of machines and structures; supplemented by laboratory experiments. I, II; 3. Prerequisite: Senior standing in engineering; consent of instructor. SINGER, TRIGGER.

291. **Mechanical Engineering Seminar.** Discussion and presentation of selected topics from the current problems and literature in mechanical engineering. I, II; 1. Prerequisite: Senior standing in mechanical engineering. PARKER and others.

297. **Experimental Investigation.** Instrumentation and planning of investigations in mechanical engineering research. I, II; 3. Prerequisite: Senior standing in mechanical engineering; consent of instructor. STAFF.

298. **Thesis.** Investigation of special subjects and preparation of thesis embodying report on investigation, review of literature, and discusison of results. I, II; 3. Prerequisite: Mechanical Engineering 297. STAFF.

299. **Inspection Trip.** A two- to three-day inspection trip to a selected number of industrial installations which represent typical examples of the practice of mechanical engineering. Required of all seniors in mechanical engineering. I; no credit. Prerequisite: Senior standing in mechanical engineering. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Engineering Thermodynamics.** Application of thermodynamics to engineering processes with special attention to steady flow of a compressible medium in insulated or non-insulated ducts, availability of thermal energy, heat and power from combustion, methods of formulation and correlation of properties of a pure substance, and effect of equilibrium on the analysis of internal combustion engines and cycles. I, II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 205 and 206; consent of instructor. ESPY.

303. **Fuels and Combustion.** Fuel resources; composition and specification of natural and manufactured fuels; combustion stoichiometry; fuel calorimeters; coal, oil, and gas burners; fire box and chimney design; smoke abatement. I; 3 hours, or ½ to ¾ unit. Prerequisite: Chemistry 101 and 104, or equivalent; Mechanical Engineering 207, or equivalent. Designed as an elective for students in general, heating and ventilating, and power options in mechanical engineering. FELLOWS.

305. **Thermodynamics of High-Velocity Flow.** The thermodynamics of gases during high-velocity flow within enclosed channels using Mach number as the fundamental variable. Analyses of the basic flow equations, effects of friction and plane shock theory. Application to thermodynamic cycles involving nozzles, diffusers, compressors, combustion, and turbines. I, II; 3. Prerequisite: Mechanical Engineering 206, or consent of instructor. ZUBKO.

311. **Instrumentation and Measurements.** Instruments and measuring equipment for flow, temperature, pressure, speed, and gas analysis. I, II; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. KONZO, MCCLAY.

314. **Lubrication.** The theories of lubrication; manufacture and properties of lubricants; methods of testing; lubrication methods and appliances. A study of the lubrication

requirements of machines of many kinds. I; 3 hours, or ½ to ¾ unit. Prerequisite: Undergraduate courses in machine design and fluid mechanics.

**332. Theory of Internal Combustion Engines.** Study of thermodynamics of reciprocating engine cycles, considering such factors as chemical dissociation, heat loss, combustion chamber shape, and flow through valves and manifolds. II; 3 hours, or ½ to ¾ unit. Prerequisite: Undergraduate course in internal combustion engines. HULL.

**358. Problems in Industrial Safety.** Course deals with specific safety problems such as machine guarding, industrial hygiene, use of accident-cause codes, accident costs vs. safety costs, plant inspection technique and practice, injury investigations, fire prevention and application of fire codes. II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 235. HARPER.

**361. Railway Motive Power Equipment.** A technical sudy of the various types of motive power used on railways with special emphasis on steam, Diesel, and electric locomotives, and secondary consideration to special types such as the steam turbine, turbo-electric, and gas turbine locomotives. I; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. SCHRADER.

**362. Railway Motive Power Operation.** A study of the conditions under which railway motive power operates. Economics of operation, present equipment, proposed new equipment, servicing and maintenance; availability; train resistance, motive power, tractive force, speed time and distance curves, preparation of time tables; problems in stopping trains; terminal and repair facilities. II; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering. SCHRADER.

**371. Petroleum Production Engineering—Field Development.** Properties of petroleum, oil reservoirs, exploration and drilling methods, casing methods, and well logging. I; 3 hours, or ½ to ¾ unit. Prerequisite: Senior standing in mechanical engineering; consent of instructor. LARSON.

**372. Petroleum Production Engineering.** Study of reservoir performance, principle of oil and gas recovery, storage and transportation, and economics of oil field exploitation. II; 3 hours, or ½ to ¾ unit. Prerequisite: Mechanical Engineering 371. LARSON.

## Metallurgical Engineering

(See Mining and Metallurgical Engineering)

# MILITARY SCIENCE AND TACTICS

*Professor:* Colonel M. A. HATCH (Head of Department).
*Associate Professors:* Lieutenant Colonels T. C. ANDERSON, E. F. BERENDT, V. MCBRIDE, J. G. PORTER, G. F. SPIEGEL.
*Assistant Professors:* Majors J. T. CLARK, R. M. FERRELL, S. R. MARCONI, C. M. RUSSELL, W. J. WHITESELL; Captains E. R. CAMPBELL, E. M. CHAPMAN, G. H. FRALLEY, J. K. GILHAM, L. E. KAUFER, J. H. MATTHEWS, JR., R. F. MAY, R. W. MCINTIRE, J. I. MILLS, T. E. PETERS, E. R. REUTER, W. A. TONNING.
*Instructor:* Warrant Officer O. M. HARVEY.
*Assistants:* Master Sergeants J. W. ARNSDORF, H. A. BECKLEY, E. G. CLARK, O. E. COYLE, G. G. DAUBEK, W. C. GIDDINGS, C. R. MYERS, D. W. OWENS, R. W. WOOD; Sergeants First Class T. E. FLETCHER, L. D. GIONET, C. O. HODGE, J. R. MALINOWSKI, C. B. SCOTT, M. TULAK; Sergeants R. W. BEDFORD, A. SCHAF.

### COURSES FOR UNDERGRADUATES

**101. Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, military organization, military policy, evolution of warfare, maps and aerial photographs. I; 1. Prerequisite: Citizen of United States; physically fit. TONNING (Director of Freshmen), MCINTIRE.

**102. Freshman Drill and Theory.** Basic military instruction to include leadership, drill and exercise of command, first aid and hygiene, weapons, and military problems of the United States. II; 1. Prerequisite: Citizen of United States; physically fit. TONNING (Director of Freshmen), MCINTIRE.

**103. Infantry Sophomore Drill and Theory.** Basic infantry instruction to include leadership, drill and exercise of command, organization of infantry units, weapons, marksmanship, technique of fire of rifle squad, combat formations, scouting and patrolling, tactics of rifle squad. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. REUTER, SPIEGEL.

**104. Infantry Sophomore Drill and Theory.** Continuation of Military Science 103. II; 1. Prerequisite: Military Science 102 and/or 103, or equivalent approved by head of department and institution. REUTER, SPIEGEL.

**123. Armor Sophomore Drill and Theory.** Basic armor instruction to include leadership, drill and exercise of command, basic communications, basic motors, history and missions of armor, mechanical training with tank weapons, scouting and patrolling, and weapons. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. CLARK, MILLS.

**124. Armor Sophomore Drill and Theory.** Continuation of Military Science 123. II; 1. Prerequisite: Military Science 102 and/or 123, or equivalent approved by head of department and institution. CLARK, MILLS.

**133. Corps of Engineers Sophomore Drill and Theory.** Basic engineer instruction to include leadership, drill and exercise of command, history and tradition of Corps of Engineers, characteristics of weapons, camouflage, defense against chemicals, explosives and demolitions, hand tools and rigging, mines and booby traps, organization and tactics of small units, organization of the ground and field fortifications. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. MAY, MCBRIDE.

**134. Corps of Engineers Sophomore Drill and Theory.** Continuation of Military Science 133. II; 1. Prerequisite: Military Science 102 and/or 133, or equivalent approved by head of department and institution. MAY, MCBRIDE.

**143. Signal Corps Sophomore Drill and Theory.** Basic Signal Corps instruction to include leadership, drill and exercise of command, introduction to signal communications, organization and missions of Signal Corps, organization and signal communications, practices of infantry, armored and airborne divisions. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. BERENDT, CAMPBELL.

**144. Signal Corps Sophomore Drill and Theory.** Continuation of Military Science 143. II; 1. Prerequisite: Military Science 102 and/or 143, or equivalent approved by head of department and institution. BERENDT, CAMPBELL.

**153. Quartermaster Corps Sophomore Drill and Theory.** Basic quartermaster instruction to include leadership, drill and exercise of command, organization for supply in the army, organization and functions of Quartermaster Corps, classification of supplies, use of supply catalogs and bases of allowances, property accountability and responsibility, research and development of supplies in Quartermaster Corps, organization, functions, and operation of quartermaster units, and unit and organizational supply. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

**154. Quartermaster Corps Sophomore Drill and Theory.** Continuation of Military Science 153. II; 1. Prerequisite: Military Science 102 and/or 153, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

**163. Antiaircraft Artillery Sophomore Drill and Theory.** Basic antiaircraft artillery instruction to include leadership, drill and exercise of command, introduction to AAA weapons, characteristics, capabilities, and limitations of AAA automatic weapons, service of the piece—automatic weapons fire unit, introduction to AAA guns, charac-

teristics, capabilities, and limitations of 90-mm. AAA guns, and service of the piece—90-mm. AAA guns. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. MARCONI, MATTHEWS.

**164. Antiaircraft Artillery Sophomore Drill and Theory.** Continuation of Military Science 163. II; 1. Prerequisite: Military Science 102 and/or 163, or equivalent approved by head of department and institution. MARCONI, MATTHEWS.

**173. Transportation Corps Sophomore Drill and Theory.** Basic transportation instruction to include leadership, drill and exercise of command, introduction to Transportation Corps, economics of military transportation, military highway transport and highway organization and operation. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. KAUFER, RUSSELL.

**174. Transportation Corps Sophomore Drill and Theory.** Continuation of Military Science 173. II; 1. Prerequisite: Military Science 102 and/or 173, or equivalent approved by head of department and institution. KAUFER, RUSSELL.

**183. Army Security Agency Sophomore Drill and Theory.** Basic instruction in army security to include leadership, drill and exercise of command, organization and functions of Army Security Agency, means of signal communication, basic cryptography, radio intercept and direction finding, elementary cryptanalysis, and theory and application of traffic analysis. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. CHAPMAN, FRALLEY.

**184. Army Security Agency Sophomore Drill and Theory.** Continuation of Military Science 183. II; 1. Prerequisite: Military Science 183, or equivalent approved by head of department and institution. CHAPMAN, FRALLEY.

**193. Ordnance Corps Sophomore Drill and Theory.** Basic instruction to include leadership, drill and exercise of command, the role of Ordnance, automotive matériel, small arms matériel, ammunition matériel, artillery matériel, and fire control matériel. I; 1. Prerequisite: Military Science 101 and/or 102, or equivalent approved by head of department and institution. PETERS, WHITESELL.

**194. Ordnance Corps Sophomore Drill and Theory.** Continuation of Military Science 193. II; 1. Prerequisite: Military Science 102 and/or 193, or equivalent approved by head of department and institution. PETERS, WHITESELL.

### COURSES FOR ADVANCED UNDERGRADUATES

**205. Infantry Junior Drill and Theory.** Advanced instruction in infantry to include leadership, drill and exercise of command, organization, weapons, gunnery, communications, combat intelligence, estimate of situation and combat orders, field fortifications, and tactics of rifle and heavy weapons platoon and companies. I; 3. Prerequisite: Military Science 104, or equivalent approved by head of department and institution. REUTER, SPIEGEL.

**206. Infantry Junior Drill and Theory.** Continuation of Military Science 205. II; 3. Prerequisite: Military Science 205. REUTER, SPIEGEL.

**207. Infantry Senior Drill and Theory.** Continuation of Military Science 206 to include command and staff communications, motors and transportation, supply and evacuation, troop movement, new developments, the military team, tactics, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 206. REUTER, SPIEGEL.

**208. Infantry Senior Drill and Theory.** Continuation of Military Science 207. II; 3. Prerequisite: Military Science 207. REUTER, SPIEGEL.

**225. Armor Junior Drill and Theory.** Advanced instruction in armor to include leadership, drill and exercise of command, communications, gunnery, motors, organization, tactics, tank driving, and troop leading. I; 3. Prerequisite: Military Science 124, or equivalent approved by head of department and institution. CLARK, MILLS.

**226. Armor Junior Drill and Theory.** Continuation of Military Science 225. II; 3. Prerequisite: Military Science 225. CLARK, MILLS.

**227. Armor Senior Drill and Theory.** Continuation of Military Science 226 to include combat intelligence, communications, gunnery, motors, new developments, supply and evacuation, tactics, tank driving, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 226. CLARK, MILLS.

**228. Armor Senior Drill and Theory.** Continuation of Military Science 227. II; 3. Prerequisite: Military Science 227. CLARK, MILLS.

**235. Corps of Engineers Junior Drill and Theory.** Advanced instruction in Corps of Engineers to include bridge design and classification, engineer signal communications, engineer combat intelligence, engineer supply, military roads and runways, organization of engineer units, organization of combat divisions, tactics of engineer units, vehicle operation and maintenance, water supply and individual weapons and marksmanship. I; 3. Prerequisite: Military Science 134, or equivalent approved by head of department and institution. Open to students pursuing any engineering curriculum or applied course such as geology, chemistry, physics, etc. MAY, MCBRIDE.

**236. Corps of Engineers Junior Drill and Theory.** Continuation of Military Science 235. II; 3. Prerequisite: Military Science 235. MAY, MCBRIDE.

**237. Corps of Engineers Senior Drill and Theory.** Continuation of Military Science 236 to include engineer support for the Air Force, the communication zone and for the type field army, command and staff, construction, utilities and job management, motor movements, river crossing operations, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 236. MAY, MCBRIDE.

**238. Corps of Engineers Senior Drill and Theory.** Continuation of Military Science 237. II; 3. Prerequisite: Military Science 237. MAY, MCBRIDE.

**245. Signal Corps Junior Drill and Theory.** Advanced signal corps instruction to include communications security, signal orders, field wire and field radio communication fundamentals, applied signal communication, message center and communication center procedure, signal supply and repair, career guidance program for Signal Corps officers, and weapons and marksmanship. Tactics of the rifle squad. I; 3. Prerequisite: Military Science 144, or equivalent approved by head of department and institution. Open to students enrolled in academic courses leading to a degree in engineering, electronics, or physics. Students enrolled in courses other than these may be admitted as a second priority. BERENDT, CAMPBELL.

**246. Signal Corps Junior Drill and Theory.** Continuation of Military Science 245. II; 3. Prerequisite: Military Science 245. BERENDT, CAMPBELL.

**247. Signal Corps Senior Drill and Theory.** Continuation of Military Science 246 to include wire and radio communication matériel, higher echelon signal communication and equipment, post signal operations and administrative procedure, career guidance plan for Signal Corps officers, darkroom technique and photographic practices, command and staff, combat intelligence, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 246. BERENDT, CAMPBELL.

**248. Signal Corps Senior Drill and Theory.** Continuation of Military Science 247. II; 3. Prerequisite: Military Science 247. BERENDT, CAMPBELL.

**255. Quartermaster Corps Junior Drill and Theory.** Advanced quartermaster instruction to include station and depot supply, storage, warehousing and materials handling, procurement, storage and distribution of petroleum products, commissary, post and field laundry, garrison and field bakery operations, salvage operations and procedures, maintenance and reclamation of quartermaster supplies, graves registration and mortuary activities, food service activities, and individual weapons and marksmanship. I; 3. Prerequisite: Military Science 154, or equivalent approved by head of department and institution. ANDERSON, FERRELL.

**256. Quartermaster Corps Junior Drill and Theory.** Continuation of Military Science 255. II; 3. Prerequisite: Military Science 255. ANDERSON, FERRELL.

**257. Quartermaster Corps Senior Drill and Theory.** Continuation of Military Science 256 to include field and procurement procedures, command and staff, combat intelligence, technical intelligence, organization and functions of the combat arms and technical services, quartermaster operations in the zone of interior and theater of operations, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 256. ANDERSON, FERRELL.

**258. Quartermaster Corps Senior Drill and Theory.** Continuation of Military Science 257. II; 3. Prerequisite: Military Science 257. ANDERSON, FERRELL.

**265. Antiaircraft Artillery Junior Drill and Theory.** Advanced antiaircraft artillery instruction to include AAA tactics, basic gunnery for AAA guns and automatic weapons, communications, individual weapons and marksmanship, motors and transportation, organization and troop movements. Tactics of the rifle squad. I; 3. Prerequisite: Military Science 164, or equivalent approved by head of department and institution. MATTHEWS.

**266. Antiaircraft Artillery Junior Drill and Theory.** Continuation of Military Science 265. II; 3. Prerequisite: Military Science 265. MARCONI, MATTHEWS.

**267. Antiaircraft Artillery Senior Drill and Theory.** Continuation of Military Science 266 to include AAA matériel and advanced tactics, command and staff, combat intelligence, gunnery, military team, new developments, supply and evacuation, field artillery capabilities and employment, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 266. MARCONI, MATTHEWS.

**268. Antiaircraft Artillery Senior Drill and Theory.** Continuation of Military Science 267. II; 3. Prerequisite: Military Science 267. MARCONI, MATTHEWS.

**275. Transportation Corps Junior Drill and Theory.** Advanced transportation instruction to include organization of the transportation staff sections, organization and operation of railroads, military railway service, movements, port and stevedore operations, harbor craft and marine maintenance, highway transport service organization, and individual weapons and marksmanship. Tactics of the rifle squad. I; 3. Prerequisite: Military Science 174, or equivalent approved by head of department and institution. KAUFER, RUSSELL.

**276. Transportation Corps Junior Drill and Theory.** Continuation of Military Science 275. II; 3. Prerequisite: Military Science 275. KAUFER, RUSSELL.

**277. Transportation Corps Senior Drill and Theory.** Continuation of Military Science 276 to include theater of operations problems of military railway service, highway transport operations, highway traffic regulations and control and movements control; logistics, overseas supply, command and staff, combat intelligence responsibilities of a Transportation Corps officer, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 276. KAUFER, RUSSELL.

**278. Transportation Corps Senior Drill and Theory.** Continuation of Military Science 277. II; 3. Prerequisite: Military Science 277. KAUFER, RUSSELL.

**285. Army Security Agency Junior Drill and Theory.** Advanced instruction in army security to include leadership, drill and exercise of command, individual weapons and marksmanship, organization and functions of army security agency, radio intercept and direction finding, military crypto systems, communication security, elementary cryptanalysis. I; 3. Prerequisite: Military Science 184, or equivalent approved by head of department and institution. CHAPMAN, FRALLEY.

**286. Army Security Agency Junior Drill and Theory.** Continuation of Military Science 285. II; 3. Prerequisite: Military Science 285. CHAPMAN, FRALLEY.

**287. Army Security Agency Senior Drill and Theory.** Continuation of Military Science 286 to include command and staff, combat intelligence, elementary cryptanalysis, theory and application of traffic analysis, cryptomaterial distribution and accounting, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 286. CHAPMAN, FRALLEY.

**288. Army Security Agency Senior Drill and Theory.** Continuation of Military Science 287. II; 3. Prerequisite: Military Science 287. CHAPMAN, FRALLEY.

**295. Ordnance Corps Junior Drill and Theory.** Advanced instruction in ordnance to include functional organization of ordnance department; automotive, small arms, ammunition, artillery and fire control matériel; ammunition supply; individual weapons and marksmanship. I; 3. Prerequisite: Military Science 194, or equivalent approved by head of department and institution. Open to students enrolled in College of Engineering or those majoring in chemistry or physics. PETERS, WHITESELL.

**296. Ordnance Corps Junior Drill and Theory.** Continuation of Military Science 295. II; 3. Prerequisite: Military Science 295. PETERS, WHITESELL.

**297. Ordnance Corps Senior Drill and Theory.** Continuation of Military Science 296 to include maintenance and supply, command of staff, combat intelligence, matériel specialty, military administration and personnel management, geographical foundations of national power, military teaching methods, and psychological warfare. I; 3. Prerequisite: Military Science 296. PETERS, WHITESELL.

**298. Ordnance Corps Senior Drill and Theory.** Continuation of Military Science 297. II; 3. Prerequisite: Military Science 297. PETERS, WHITESELL.

## MINING AND METALLURGICAL ENGINEERING

*Professors:* H. L. WALKER (Head of Department), P. A. BECK, W. R. CHEDSEY, W. H. VOSKUIL.
*Associate Professors:* W. H. BRUCKNER, G. B. CLARK, E. J. ECKEL, A. C. FORSYTH, B. G. RICKETTS, C. A. WERT.
*Assistant Professors:* R. W. BOHL, V. D. HILDEBRANDT, J. W. MARX, R. G. WUERKER.
*Assistants:* CHOH-YI ANG, R. D. CAUDLE, T. E. COLEMAN, JR., J. HINO, J. M. SIVERTSEN.

### Mining Engineering

#### COURSES FOR UNDERGRADUATES

**151. Elements of Mining.** Theory and practice in explosives, drilling, blasting, tunneling, shaft sinking, prospecting (including geophysical), exploration and development. I; 4. Prerequisite: Sophomore standing. CLARK.

**152. Fuels.** A study of solid, liquid, and gaseous fuels, and their uses, with laboratory work on the analysis of coal and coke. II; 3. Prerequisite: Chemistry 104, or equivalent. CHEDSEY, WUERKER.

#### COURSES FOR ADVANCED UNDERGRADUATES

**204. Mine Surveying.** Methods of underground surveying. II; 2. Prerequisite: Civil Engineering 115, or equivalent. CHEDSEY.

**205. Summer Mine Surveying.** Two weeks practice in underground surveying in an Illinois coal mine. S; 2. Prerequisite: Mining Engineering 204. CHEDSEY.

**230. Mining Principles.** General course for students in curricula other than mining engineering. Drilling and blasting; prospecting; mining methods; haulage; hoisting; venti-

lation; mine evaluation and administration. I or II; 3. Prerequisite: Junior standing. CLARK.

**251. Mine Administration.** Mining law, wage agreements, compensation, safety, and welfare. I; 3. Prerequisite: Senior standing in mining engineering. CHEDSEY.

**253. Principles of Mining Methods.** Principles and modern practices of coal and metal mining methods and how they are affected by the physical character of ore and rock as related to geophysics and geochemistry. I; 4. Prerequisite: Mining Engineering 151; senior standing in mining engineering, or consent of instructor. CLARK.

**255. Mineral Dressing.** Crushing, grinding, sampling, screening, classification, flotation; flow sheets. I; 3. Prerequisite: Junior standing in mining engineering. CHEDSEY, WUERKER.

**256. Mine Examination and Valuation.** Methods of examining, valuing, and reporting on mining properties. II; 2. Prerequisite: Mining Engineering 253. CHEDSEY.

**257. Haulage, Hoisting, and Pumping.** Haulage: mine cars, locomotives, track problems, conveyors, scrapers, machine design; hoisting: ropes, cages, and skips, hoisting engines; mine drainage and pumping. I; 4. Prerequisite: Electrical Engineering 208; Mechanical Engineering 201. WUERKER.

**258. Mining Design.** Students are assigned design projects such as design of a head frame, shop building, shaft station, trestle, etc. II; 3. Prerequisite: Senior standing in mining engineering. CLARK.

**260. Coal Preparation.** Mechanical preparation of coal; float and sink testing; washability curves; laboratory control. II; 2. Prerequisite: Mining Engineering 255. CHEDSEY, WUERKER.

**262. Mine Ventilation.** Mine gases; ventilation of mines; mine fires and explosions. II; 3. Prerequisite: Senior standing in mining engineering. CLARK.

**291. Thesis.** I; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

**292. Thesis.** II; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

**299. Inspection Trip.** Senior inspection trip to visit mining operations. I; no credit. Prerequisite: Senior standing. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**302. World Mineral Economics.** The role of minerals in a productive economy, the interdependence of minerals in industrial society and the problems arising out of their unequal geographic distribution and divided political control. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. VOSKUIL.

**304. Mine Safety Engineering.** A detailed study of mine accident statistics, causes of accidents, accident prevention; calculation of insurance rates and cost of mine accidents; psychology of accident prevention; state and federal mining laws as related to safety. I; 3 hours, or 1 unit. CLARK.

**351. Geophysics of Mining.** Same as Geology 351. Principles of geophysics and their application to mining processes. I; 3 hours, or 1 unit. Prerequisite: Senior standing in engineering or geology, or consent of instructor. WUERKER.

**354. Mining Geology.** Same as Geology 354. Structure and occurrence of mineral deposits in relation to prospecting, exploration, development, and exploitation. II; 4 hours, or 1 unit. CLARK.

**396. Seminar.** Review of mining literature; reports; technical writing. II; 1 hour, or ¼ unit. Prerequisite: Senior standing. CHEDSEY.

## Metallurgical Engineering

### COURSES FOR UNDERGRADUATES

**150. Introduction to Metallurgy.** Minerals and mineral dressing, fuels, refractories, roasting, sintering, and other basic processes of metallurgy. I, II; 3. Prerequisite: Chemistry 105, or equivalent. HILDEBRANDT.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Principles of Physical Metallurgy.** Constitutional diagrams; equilibrium and nonequilibrium conditions; properties of metals and alloys related to structure; elementary physics of metals. I, II; 3. Prerequisite: Junior standing. HILDEBRANDT.

**203. Physical Metallurgy Laboratory.** Construction of simple binary constitution diagrams; use of the metallurgical microscope; study of the microstructure of simple binary alloys. Laboratory to accompany Metallurgical Engineering 201. I, II; 1. Prerequisite: Junior standing; registration in Metallurgical Engineering 201. FORSYTH.

**205. Metallurgy of Iron and Steel.** Production of pig iron, wrought iron, and steel; blast, Bessemer, open hearth, and electric furnaces; iron ores and slags. I or II; 3. Prerequisite: Chemistry 105; registration in Metallurgical Engineering 207. BOHL.

**207. Metallurgical Calculations.** Fundamental calculations relating to processes, heat balances, and the thermochemistry of metallurgical reactions. I or II; 2. Prerequisite: Chemistry 123, or equivalent; registration in Metallurgical Engineering 205. HILDEBRANDT.

**208. Ferrous Metallography.** Internal structure, constitution, treatment, and properties of iron, plain carbon steel, and cast iron. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; registration in Theoretical and Applied Mechanics 221 and 223. ECKEL.

**210. Ferrous Metallography Laboratory.** Metallographic preparation of ferrous metal specimens; use of metallurgical microscope; photomicrography, analysis and interpretation of structures developed by heat treatment and by mechanical working. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; registration in Metallurgical Engineering 208. BOHL, HILDEBRANDT.

**214. Electrometallurgy.** Electrochemical principles applied to metallurgical processes. Production metallurgy of aluminum and magnesium. I or II; 2. Prerequisite: Metallurgical Engineering 150; registration in Metallurgical Engineering 216. RICKETTS.

**216. Electrometallurgy Laboratory.** Laboratory practice demonstrating the principles of electroplating, electrorefining, and electrowinning. I or II; 1. Prerequisite: Registration in Metallurgical Engineering 214. RICKETTS.

**218. Physics of Metals.** Atomic arrangements in metals and alloys; elastic and plastic behavior of metals; internal friction; diffusion; modern concepts of metal physics. II; 3. Prerequisite: Metallurgical Engineering 201. MARX.

**230. Engineering Metallurgy.** For students in curricula other than metallurgical engineering. Principles of crystallization of metals; constitution diagrams necessary for full understanding of the heat treatment of steels; properties of metals and alloys (ferrous and nonferrous) as related to structure, treatment, and engineering applications. I, II; 3. Prerequisite: Chemistry 104, 105, or 106; junior standing. FORSYTH.

**251. Nonferrous Metallography.** Internal structure, constitution, treatment, and properties of nonferrous metals and alloys. I, II; 3. Prerequisite: Metallurgical Engineering 201 and 203; Theoretical and Applied Mechanics 221 and 223. ECKEL.

**253. Nonferrous Metallography Laboratory.** Preparation of metallographic specimens and development of microscopic structures; photomicrography, interpretation of structures developed in nonferrous alloys. I, II; 3. Prerequisite: Metallurgical Engineering 208; registration in Metallurgical Engineering 251. BOHL, HILDEBRANDT.

**255. Metallurgy of Nonferrous Metals.** Continuation of Metallurgical Engineering 214. Processes for the recovery of copper, gold, lead, nickel, silver, tin, and zinc. I; 3. Prerequisite: Metallurgical Engineering 214. RICKETTS.

**256. Metallurgy of Deep Drawing and Pressing.** The general and specific defects and difficulties encountered in the deep drawing and pressing of steel, brass, aluminum, magnesium, copper, nickel, and stainless steel sheet metal. I, II; 3. Prerequisite: Metallurgical Engineering 208, 210, 251, and 253. BOHL.

**258. Alloy Steels.** Low-alloy and high-yield strength constructional steels; elements acting as ferrite strengtheners; elements acting as carbide formers; intermediate alloy steels; effect of elements upon heat treatment and properties; correlation of properties with service requirements. I, II; 3. Prerequisite: Metallurgical Engineering 208 and 210. FORSYTH.

**260. Advanced Physical Metallurgy Laboratory.** Laboratory practice applying much of the material learned in previous courses. Most of the heat treating, metallographic, and special testing equipment in the department is used. I, II; 3. Prerequisite: Senior standing in metallurgical engineering. RICKETTS.

**291. Thesis.** I; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

**292. Thesis.** II; 1 to 3. Prerequisite: High standing and approval of head of department. STAFF.

**295. Metallurgical Seminar.** Review of current metallurgical literature; classroom reports and discussion; preparation of technical abstracts and reports. I, II; 1. Prerequisite: Senior standing in metallurgical engineering. WALKER.

**296. Metallurgical Seminar.** Continuation of Metallurgical Engineering 295. I, II; 1. Prerequisite: Senior standing in metallurgical engineering. WALKER.

**299. Inspection Trip.** Senior inspection trip to visit metallurgical industries. I; no credit. Prerequisite: Senior standing. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Metallurgy of Welding.** A survey is made of existing welding procedures and their metallurgical (ferrous and nonferrous) consequences with respect to the weld and base metal involved thermally in the welding operations. Heat flow in metals, arc behavior, slag behavior, and the physical metallurgy of heat-affected base metal are considered. Engineering phases of welding covered are economics of welding in relation to other methods of joining metals or producing engineering structures, thermal stresses, specification of materials for weld and base metal, and methods of production by means of welding and gas cutting. I or II; 3 hours, or ¾ or 1 unit. Prerequisite: Senior standing in metallurgical engineering; Metallurgical Engineering 208 and 210. BRUCKNER.

**302. Powder Metallurgy.** Production of powdered metals; fabrication of metal shapes from powdered metals; compacting, sintering, testing, and application of powdered metal shapes. II; 2 hours, or ½ or ¾ unit. Prerequisite: Approval of department; registration in Metallurgical Engineering 304; senior standing. ECKEL.

**304. Powder Metallurgy Laboratory.** Experiments involving the testing, briquetting, sintering, repressing of metal powders, and the testing of sintered compacts. II; 1 hour, or ¼ unit. Prerequisite: Approval of department; registration in Metallurgical Engineering 302; senior standing. ECKEL.

**305. Metallurgy of Steel Castings.** Technical and metallurgical control in the production of steel castings; acid and basic furnace practices; control of slag in steelmaking; heat treatment and metallography of steel castings. I, II; 3 hours, or ¾ or 1 unit. Prerequisite: Metallurgical Engineering 205, 208, and 210. FORSYTH.

308. **Metallurgical Kinetics and Thermodynamics.** Fundamental thermodynamic considerations and application of thermodynamics to metallurgical problems. II; 3 hours or ¾ unit. Prerequisite: Senior standing; Chemistry 246. Offered in 1951-1952 and in alternate years. HILDEBRANDT.

309. **Mechanical Behavior of Metals.** The fundamental properties of metal crystals are studied with particular emphasis on electrical, thermal, and elastic properties; the fundamentals of crystal plasticity; slip, twinning, dislocations in single and polycrystals; the anelastic properties of metals, with emphasis on internal friction. I; 3 hours or 1 unit. Prerequisite: Consent of instructor. Offered in 1952-1953 and in alternate years.

310. **Kinetics of Phase Changes in Metals.** Diffusion in metals; the role of diffusion in processes important in metallurgy; nucleation and kinetics of phase changes in metals; examples of phase changes and their importance; the precipitation hardening systems. II; 3 hours, or 1 unit. Prerequisite: Consent of instructor. Offered in 1952-1953 and in alternate years.

## MUSIC

*Professors:* D. A. BRANIGAN (Director of School of Music), S. FLETCHER, B. R. FOOTE, A. A. HARDING (Emeritus), W. G. HILL, M. H. HINDSLEY, H. KESSLER, J. M. KUYPERS, R. H. MILES, P. ROLLAND, S. SCHOONMAKER, G. F. SCHWARTZ (Emeritus), P. YOUNG.

*Associate Professors:* DOROTHY E. BOWEN, B. M. GOODMAN, L. R. HAMP, K. KELLOGG, C. LEONHARD, J. P. PAINTER, P. S. PETTINGA, B. PHILLIPS, L. A. POTTER, W. L. ROOSA, H. C. SCHMITT, S. STRAVINSKY, R. H. SWENSON, EDITH USRY, G. R. WALLER, JANE C. WATT, E. WEIGEL, VELMA K. WILSON, L. ZIRNER.

*Assistant Professors:* J. ALLEN, G. W. BINKERD, BETH BRADLEY, J. BRYDEN, N. CAZDEN, J. GARVEY, G. HUNTER, J. R. KELLY, E. D. KISINGER, W. KUHN, A. J. MCDOWELL, W. H. MILLER, CLAIRE RICHARDS, T. S. RICHARDSON, H. O. SEXTON, MIRIAM B. STEWART, GRACE WILSON.

*Instructors:* A. M. CARTER (Assistant to the Director of School of Music), DOROTHY E. CLARK, R. GARRETSON, M. C. HOWE, MARY F. JAMES, B. JOHNSTON, M. KAPLAN, COLLEEN J. KIRK, E. KROLICK, D. A. LEDET, W. P. MALM (on leave), P. W. PRICE, E. V. PUTNIK, L. A. STARR.

*Assistants:* J. BAILEY, A. BROWN, F. K. CAMPBELL, G. H. CRUMB, JR., J. CURATILO, K. MCCARTY, MARY H. MCCARTY, ROSEMARY MALOCSAY, MARJORIE SCHLAMP, MARLENE SHEPARD, MILDRED SHIELDS, R. VAN NUYS, R. WATKINS, R. WILLIAMS, M. ZOSCHKE.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Thirty-two hours in music including the following: Music 102, 103, 106, 107, 226, and 227; two hours of Music 246; four hours of applied music (Music 160-177); six hours of electives in advanced music history. Students unable to pass the qualifying examination required for registration in Music 102 must take Music 100 in excess of graduation requirements.

The qualifying examination in piano given at the time of entrance presumes a moderate degree of proficiency (scales, simple compositions, and sight reading, together with an adequate keyboard technique). Students unable to meet this proficiency must satisfy this requirement in excess of curriculum requirements in applied music.

**Minors:** Twenty hours in one or two subjects chosen from the following list: history, languages, language and literature, philosophy, physics, physiology, psychology, sociology and anthropology. At least eight hours must be taken in each subject if two are chosen.

### COURSES FOR UNDERGRADUATES

100. **Rudiments of Theory.** Notation, scales, intervals, chords, terminology. Required of all School of Music students who fail the placement examination in Theory of Music. Open to students from the other colleges of the University. I, II; 2. BRADLEY, BRYDEN.

**102. Theory of Music.** Harmony, counterpoint, and ear training. A study of the basic principles involved in the art of musical composition, including fundamental relationship of tones, melodic and harmonic construction in two and three parts, using intervals and triads with inversions. Instruction is carried out by means of aural perception, dictation, sight-singing, work at the keyboard, improvisation, written assignments, historical examples, individual research problems, and the complete process of writing, preparing and bringing to performance with voices and instruments specific individual and group projects in musical composition. I, II; 4. Prerequisite: Music 100, or equivalent. BINKERD, JOHNSTON, KELLY, KROLICK, POTTER, PUTNIK, WEIGEL.

**103. Theory of Music.** Harmony, counterpoint, and ear training. A study of the basic principles involved in the art of musical composition, including fundamental relationship of tones; melodic and harmonic construction in two and three parts, using intervals and triads with their inversions. Instruction is carried out by means of aural perception, dictation, sight-singing, work at the keyboard, improvisation, written assignments, historical examples, individual research problems, and the complete process of writing, preparing, and bringing to performance with voices and instruments specific individual and group projects in musical composition. I, II; 4. Prerequisite: Music 102, or equivalent. BINKERD, JOHNSTON, KELLY, POTTER, PUTNIK, WEIGEL.

**106. Theory of Music.** Harmony, counterpoint, and ear training. Harmony and keyboard harmony. I, II; 4. Prerequisite: Music 103, or equivalent. BINKERD, CARTER, HUNTER, LEDET, PUTNIK.

**107. Theory of Music.** Harmony, counterpoint, and ear training. Harmony and keyboard harmony. I, II; 4. Prerequisite: Music 106. BINKERD, CARTER, HUNTER, JOHNSTON, LEDET.

**110. Appreciation of Music.** Opera. Historical development of opera, emphasizing and analyzing stylistic, national trends, and musical and dramatic expression. I, II; 2. Prerequisite: Sophomore standing. ZIRNER.

**114. Appreciation of Music.** Symphonic poems and symphonies. I, II; 2. Prerequisite: Sophomore standing. KUYPERS.

**117. Appreciation of Music.** Symphonies, symphonic poems, and chamber music. II; 2. Prerequisite: Music 114, or consent of instructor. KUYPERS.

**120. Introduction to the History of Music.** A survey of the art of music among the other arts and in the life of man. For music students only. I; 2. ROOSA.

**121. Introduction to the History of Music.** A survey of the art of music among the other arts and in the life of man. For music students only. II; 2. Prerequisite: Music 120. ROOSA.

**122. Introduction to Music Literature.** This course is designed primarily for the layman. Its main objectives are to train students in intelligent listening and to acquaint them with many great works of the literature of music. For non-music students only. I; 3. CAZDEN, KUYPERS.

**123. Introduction to Music Literature.** This course is designed primarily for the layman. Its main objectives are to train students in intelligent listening and to acquaint them with many great works of the literature of music. For non-music students only. II; 3. Prerequisite: Music 122. CAZDEN, KUYPERS.

**130. Recreational Music.** Community music agencies and facilities; recreational music programs and techniques. I, II; 2. KAPLAN.

### COURSES FOR ADVANCED UNDERGRADUATES

**210. Instrumentation.** Orchestration and arranging for orchestral groups. I, II; 2. Prerequisite: Senior standing in music. HUNTER, KROLICK, PHILLIPS.

**211. Instrumentation.** Problems in arranging for all wind instruments. I, II; 2. Prerequisite: Senior standing in music, Music 210, or consent of instructor. HUNTER, KROLICK, PHILLIPS.

212. **Music for Elementary Teachers.** A presentation of music for students preparing to teach in the elementary schools. Needed for state elementary school certificate, but not acceptable for credit in the School of Music. I; 3. V. K. Wilson.

213. **Music for Elementary Teachers.** A presentation of music for students preparing to teach in the elementary schools. Needed for state elementary school certificate, but not acceptable for credit in the School of Music. II; 3. Prerequisite: Music 212. V. K. Wilson.

214. **Elementary and Junior High School Music.** Technique and materials for teaching choral and theoretical music in the elementary and junior high school. I; 2. Prerequisite: Junior standing in music, or consent of instructor. V. K. Wilson.

215. **Senior High School Choral Music and Conducting.** Techniques and materials for teaching and conducting choral music (choruses, a cappella choirs, small vocal ensembles, voice classes, operettas, and cantatas) in the senior high school. I, II; 3. Prerequisite: Music 214, or consent of instructor. Kirk.

217. **Instrumental School Music and Conducting.** Processes involved in the teaching of instruments in classes and in the organization of instrumental groups in the elementary, junior, and senior high school. Rudiments of conducting are presented and students gain practical exeprience in conducting. I, II; 2. Prerequisite: Music 215, or consent of instructor. Kuhn.

218. **Theory and Technique of Band Pageantry.** Theories of the marching band and band pageantry, a detailed study covering the technique of drill, marching maneuvers, planning of formation sequences, charting, music for the marching band and band pageants, historical background and present trends as applied to school bands. Class work augmented by field work. I; 2. Prerequisite: Music 217 and 220, or consent of instructor; advanced undergraduate or graduate standing. Kisinger.

224. **The History and Appreciation of Music.** A survey of music and its development in Western civilization to 1750. Emphasis is given to an acquaintance with representative musical works and style, and to the understanding of musical concepts in the light of their historical background. I; 2. Kirk.

225. **The History and Appreciation of Music.** A survey of music and its development in Western civilization from 1750 to the present. Emphasis is given to an acquaintance with representative musical works and style, and to the understanding of musical concepts in the light of their historical background. II; 2. Kirk.

226. **History of Music.** General history of music to 1700; operas and oratorios to the present. For music students only. I; 2. Cazden, Roosa.

227. **History of Music.** Instrumental music and solo song from 1700 to the present. For music students only. II; 2. Prerequisite: Music 226, or sophomore standing. Cazden, Roosa.

228. **Proseminar.** A course providing special preparation for graduate study. I; 2. Prerequisite: Senior standing in music and/or consent of instructor. Hill and Graduate Staff.

229. **Proseminar.** A course providing special preparation for graduate study. II; 2. Prerequisite: Senior standing in music and/or consent of instructor. Hill and Graduate Staff.

234. **Musical Composition for Dance.** Fundamentals of music composition as related to the dance. Experience in composing musical settings with emphasis upon interval quality and tensional movement quality. I, II; 2. Prerequisite: Physical Education for Women 210 and/or consent of instructor. Johnston.

241. **University Orchestra.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. Goodman.

242. **Sinfonietta.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. Goodman.

**243. Teacher Training Orchestra.** This course provides an opportunity for music education majors to study, play, and conduct graded orchestra literature best suited to the educational needs of the public schools. I, II; ½. Prerequisite: Completion of Music 185, or consent of instructor. WALLER.

**246. Collegium Musicum.** Singing and playing of early music. Western musical culture will be covered, proceeding from earliest available compositions up to, but not including, the familiar concert repertoire. In the effort to capture the spirit of each period, instruments used will be authentic to the periods insofar as practicable. Advanced students may be allowed to share in the research leading to performance of the works used. I, II; 1. Prerequisite: Consent of instructor. HUNTER.

**250. String Ensemble.** The student participates in various ensemble groups such as trios, quartets, quintets, etc., for the study of chamber music literature. The course may be repeated or taken during the freshman and sophomore year without credit. I, II; ½. Prerequisite: Junior standing, or consent of instructor. POTTER, WALLER, and STRING FACULTY.

**252. Woodwind Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. HOWE, JAMES, LEDET, MCDOWELL, PUTNIK.

**254. Brass Ensemble.** Ensembles of mixed brasses in small and large forms. I, II; ½. Prerequisite: Junior standing, or consent of instructor. SEXTON, STARR.

**256. Percussion Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. PRICE.

**260. Piano Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. SCHOONMAKER.

**264. Organ Ensemble.** I, II; ½. Prerequisite: Junior standing, or consent of instructor. PETTINGA.

**266. Applied Music Pedagogy.** Designed to provide the student in the Bachelor of Music curriculum with practical experience in the teaching of piano, voice, or string instruments and to acquaint him with carefully selected materials appropriate for pupils at various levels of advancement. Problems of technic and style will be dealt with through lectures, discussions, demonstrations, practice teaching, and studio visitations. I, II; 1. BOWEN, BRADLEY, FLETCHER, POTTER, ROLLAND.

**271. Oratorio Society.** Performance of oratorios and other major choral works in cooperation with the University Symphony Orchestra. An advanced mixed-voice chorus open to students, faculty, and townspeople. Course credit to juniors and seniors. I, II; ½. YOUNG.

**272. University Chorus.** Performance of cantatas and other choral works. A mixed-voice chorus for average and beginning singers. Open to students, faculty, and townspeople. Course credit to juniors and seniors. I, II; ½. BRYDEN.

**273. Women's Glee Club.** Practical experience in the rehearsal and public performance of choral music of various periods and styles. Open to all women students. Course credit to juniors and seniors. I, II; ½. BRYDEN.

**274. Men's Glee Club.** Practical experience in the rehearsal and public performance of choral music of various periods and styles. Open to all men students. Meets in two sections: one for advanced singers; the other for less proficient singers. Course credit to juniors and seniors. I, II; ½. BRYDEN, YOUNG.

**275. University Choir.** Practical experience in mixed-voice singing of accompanied and unaccompanied music of various periods and styles. A highly advanced group for competent student singers. Course credit for juniors and seniors. I, II; ½. YOUNG.

**279. Opera Workshop and Ensemble.** Preparation and public performance of grand or light opera. Covers the music and acting only. Students desiring experience in costuming, stage management, scenery, publicity, etc., should apply to the Illini Theatre Guild, Lincoln Hall, which cooperates in the opera productions. Admission is by tryout test. I, II; ½. Prerequisite: Junior standing, or consent of instructor. ZIRNER.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**300. Theory of Music.** Advanced harmony; altered chords; notation and harmonization of the chromatic scale; chromatic modulation; enharmonic transformations; use of inharmonic tones; harmonic analysis. I, II; 2 hours, or ½ unit. Prerequisite: Music 107. BINKERD, WEIGEL.

**301. Theory of Music.** Advanced harmony; altered chords; notation and harmonization of the chromatic scale; chromatic modulation; enharmonic transformations; use of inharmonic tones; harmonic analysis. I, II; 2 hours, or ½ unit. Prerequisite: Music 300. HUNTER, KELLY, WEIGEL.

**302. Theory of Music.** Free counterpoint. Creative writing in linear counterpoint of the following: rounds, instrumental and vocal; canons; inventions; and fugues. Analysis of Bach inventions and well-tempered clavichord. I; 2 hours, or ½ unit. Prerequisite: Music 301. BINKERD, KELLY.

**303. Theory of Music.** Free counterpoint. Creative writing in linear counterpoint of the following: rounds, instrumental and vocal; canons; inventions; and fugues. Analysis of Bach inventions and well-tempered clavichord. II; 2 hours, or ½ unit. Prerequisite: Music 302. KELLY.

**306. Composition.** Work in original composition including the study of fugue, canon, and of the small and large homophonic forms. I, II; 3 or 5 hours, or ½ or 1 unit. Five hours credit given when course is taken as major subject involving the preparation of a recital program of original compositions. Prerequisite: Music 107, or consent of instructor. May be taken in successive semesters for up to thirty hours credit. KELLY, KESSLER, PHILLIPS, WEIGEL.

**314. Analysis of Musical Form.** An elementary, systematic survey of the principles and means employed in musical composition. I; 2 hours, or ½ unit. Prerequisite: Music 107. HILL.

**315. Analysis of Musical Form.** Continuation of Music 314. II; 2 hours, or ½ unit. Prerequisite: Music 314. HILL.

**316. Teaching of Theory and Harmony.** Techniques and materials used in the teaching of theory of music in senior high school and junior college. I; 2 hours, or ½ unit. Prerequisite: Music 300, or consent of instructor. CARTER.

**320. Advanced History of Music.** I; 2 hours, or ½ unit. Prerequisite: Music 226 and 227. HILL.

**321. Advanced History of Music.** II; 2 hours, or ½ unit. Prerequisite: Music 320. HILL.

**322. Introduction to Musicology.** A survey of the various fields open to musicological research, both systematic and historical, with bibliographical studies and elementary problems for investigation. I, II; 3 hours, or ½ unit. HILL.

**327. Contemporary Music.** A survey of all important trends, forms, and styles of modern music from 1875 to the present. I, II; 2 hours, or ½ unit. Prerequisite: Junior standing and/or consent of instructor. CAZDEN, PHILLIPS.

**330. Instrumental Clinic.** Application of principles and techniques taught in previous music education courses. II; 2 hours, or ½ unit. Prerequisite: Music 217, 221, or consent of instructor. STARR.

**331. Instrumental Clinic.** Application of principles and techniques taught in previous music education courses. II; 2 hours, or ½ unit. Prerequisite: Music 217, 221, or consent of instructor. STARR.

**332. Percussion Methods.** Designed primarily for teachers of school music who may or may not be percussion performers, but who wish to teach percussion and initiate such a program in the schools. I or II; 3 hours, or ½ unit. Prerequisite: Senior or graduate standing in music education; Music 196 and 256, or equivalent. PRICE.

**334. Methods of String Class Teaching.** This course is designed primarily for teachers of school music who are not performers on a stringed instrument yet would like to be able to teach string classes and start an orchestral program in the schools. S; 2 hours, or ½ unit. Prerequisite: Senior or graduate standing in music education, or consent of instructor. WALLER.

**336. Workshop in Music Education.** Workshop designed to develop essential facts, attitudes, and principles through a consideration of problems encountered in music education. Parallel with this study will be the preparation of resource materials for music programs in elementary and secondary schools. S; 2 to 4 hours, or ½ or 1 unit. LEONHARD.

**338. Music Bibliography and Reference.** Detailed study of the basic and most useful reference and bibliographic aids. Practice problems in the use of specific titles and in how to find materials in the library will be given. Music, books about music, and recordings of music are included in the course. I, II; 3 hours, or ½ unit. Prerequisite: For students in the School of Music, senior standing or consent of instructor; for non-music students, senior standing with at least one year each of music history and music theory at the college level, or equivalent. ALLEN.

**346. History of Performance Practices.** Study of the history of performance practices including the preparation of appropriate historical material for performance. I, II; 3 hours, or ½ unit. HUNTER.

## Applied Music

### COURSES FOR UNDERGRADUATES

**160. Piano.** Private lessons in piano on the undergraduate level. I, II; 2 or 4. S; 1 or 2. BRADLEY, FLETCHER, MCCARTY, RICHARDS, SCHLAMP, SCHOONMAKER, STRAVINSKY, USRY, WATT, ZIRNER.

**161. Voice.** Private lessons in singing on the undergraduate level. I, II; 2 or 3. S; 1 or 2. BAILEY, BOWEN, CLARK, FOOTE, HAMP, KELLOGG, MILLER, STEWART, WILSON.

**162. Organ.** Fundamental courses in organ technic and registration, culminating in performances of the easier works of Bach, Mendelssohn, Franck, and Rheinberger. I, II; 2 or 4. S; 1 or 2. MILES, PETTINGA, SHIELDS.

**163. Violin.** Private instruction in violin on the undergraduate level. I, II; 2 or 4. S; 1 or 2. GOODMAN, ROLLAND, SCHMITT, WILLIAMS.

**164. Viola.** Private instruction in viola on the undergraduate level. I, II; 2 or 4. S; 1 or 2. GARVEY.

**165. Cello.** Private instruction in cello on the undergraduate level. I, II; 2 or 4. S; 1 or 2. POTTER, SWENSON.

**166. String Bass.** Tuning by harmonics. Development of flexibility in bowing and a practical working knowledge of the first six positions. Major and minor scales, within two octaves, as well as arpeggios. String ensemble and orchestra studies and solo repertoire and studies. Study of bowing styles. I, II; 2 or 4. S; 1 or 2. KROLICK.

**167. Flute.** Private lessons in flute on the undergraduate level. I, II; 2 or 4. S; 1 or 2. JAMES, PUTNIK.

**168. Clarinet.** Private lessons in clarinet on the undergraduate level. I, II; 2 or 4. S; 1 or 2. MCCARTY, MCDOWELL.

**169. Oboe.** Private lessons in oboe on the undergraduate level. I, II; 2 or 4. S; 1 or 2. LEDET.

**170. Bassoon.** Private lessons in bassoon on the undergraduate level. I, II; 2 or 4. S; 1 or 2. JAMES.

171. **Cornet and Trumpet.** Private instruction in cornet and trumpet at the undergraduate level. I, II; 2 or 4. S; 1 or 2. SEXTON, VAN NUYS.

172. **French Horn.** Private instruction in French horn on the undergraduate level. I, II; 2 or 4. S; 1 or 2. HOWE.

173. **Trombone.** Private instruction in trombone on the undergraduate level. I, II; 2 or 4. S; 1 or 2. STARR.

174. **Baritone.** Private instruction in baritone on the undergraduate level. I, II; 2 or 4. S; 1 or 2. STARR.

175. **Tuba.** Private instruction in tuba on the undergraduate level. I, II; 2 or 4. S; 1 or 2. CAMPBELL, STARR.

176. **Percussion.** Private instruction in percussion on the undergraduate level. I, II; 2 or 4. S; 1 or 2. PRICE.

177. **Harp.** Private instruction in harp on the undergraduate level. I, II; 2 or 4. S; 1 or 2. SHEPARD.

178. **Saxophone.** I, II; 2 or 4 hours. S; 1 or 2 hours. MCCARTY, MCDOWELL.

180. **English Diction.** Phonetics applied to English song literature. Lectures, class discussions, and individual clinical analysis and practice. I; 1. BOWEN.

181. **Italian Diction.** Phonetics applied to Italian song literature. Lectures, class discussions, and individual clinical analysis and practice. II; 1. Prerequisite: Music 180, or consent of instructor. BOWEN.

182. **German Diction.** I; 1. Prerequisite: Music 180 and 181. KELLOGG.

183. **German Diction.** II; 1. Prerequisite: Music 182, or consent of instructor. KELLOGG.

184. **String Instruments.** Violin, viola, cello, and bass. Class instruction in the fundamentals of playing violin, viola, violoncello, and string bass. I, II; 2. Prerequisite: Junior standing in music, or consent of instructor. BROWN, MALOCSAY, WALLER, WILLIAMS.

190. **Clarinet.** I, II; 2. KISINGER, MCCARTY.

192. **Cornet (or Trumpet).** I, II; 2. HOWE, VAN NUYS.

194. **Flute and Saxophone.** I, II; 2. Prerequisite: Music 190 and 192. JAMES, MCCARTY.

196. **French Horn and Percussion.** I, II; 2. Prerequisite: Music 192. HOWE, PRICE.

197. **Trombone, Baritone, and Tuba.** I, II; 2. STARR.

198. **Oboe and Bassoon.** I, II; 2. Prerequisite: Music 190. JAMES, LEDET.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

360. **Piano.** Private lessons in piano on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 160; qualifying examination for transfer students. BRADLEY, EDWARDS, FLETCHER, RICHARDS, SCHOONMAKER, STRAVINSKY, USRY, WATT, ZIRNER.

361. **Voice.** Private lessons in singing on the advanced undergraduate and graduate level. I, II; 2 or 3 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 161; qualifying examination for transfer students. BOWEN, CLARK, FOOTE, HAMP, KELLOGG, MILLER, STEWART, WILSON.

362. **Organ.** A repertoire course, using graded material, culminating in performance of the masterpieces of Bach, Franck, and Rheinberger; and selected works from the pre-Bach and contemporary periods. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 162; qualifying examination for transfer students. MILES, PETTINGA.

**363. Violin.** Private instruction in violin on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 163; qualifying examination for transfer students. GOODMAN, ROLLAND, SCHMITT.

**364. Viola.** Private instruction in viola on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 164; qualifying examination for transfer students. GARVEY.

**365. Cello.** Private instruction in cello on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 165; qualifying examination for transfer students. POTTER, SWENSON.

**366. String Bass.** Tuning by harmonics. Development of flexibility in bowing and a practical working knowledge of the first six positions, also thumb positions. Major and minor scales through higher positions. String ensemble and orchestra studies; solo repertoire and studies. Study of various bowing styles. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 166; qualifying examination for transfer students. KROLICK.

**367. Flute.** Private lessons in flute on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 167; qualifying examination for transfer students. JAMES, PUTNIK.

**368. Clarinet.** Private lessons in clarinet on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 168; qualifying examination for transfer students. MCDOWELL.

**369. Oboe.** Private lessons in oboe on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 169; qualifying examination for transfer students. LEDET.

**370. Bassoon.** Private lessons in bassoon on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 170; qualifying examination for transfer students. JAMES.

**371. Cornet and Trumpet.** Private instruction in cornet and trumpet on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 171; qualifying examination for transfer students. SEXTON.

**372. French Horn.** Private instruction in French horn on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 172; qualifying examination for transfer students. HOWE.

**373. Trombone.** Private instruction in trombone on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 173; qualifying examination for transfer students. STARR.

**374. Baritone.** Private instruction in baritone on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 174; qualifying examination for transfer students. STARR.

**375. Tuba.** Private instruction in tuba on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 175; qualifying examination for transfer students. STARR.

**376. Percussion.** Private instruction in percussion on the advanced undergraduate and graduate level. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 176; qualifying examination for transfer students. PRICE.

**377. Harp.** Private lessons in harp. I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. Prerequisite: Music 177; qualifying examination for transfer students. SHEPARD.

**378. Saxophone.** I, II; 2 or 4 hours, or ½ to 1 unit. S; 1 or 2 hours, or ¼ to ½ unit. MCDOWELL.

**380. French Diction.** Principles of French pronunciation applied to French vocal literature. Class and individual clinical analysis and practice. I; 1 hour, or ¼ unit. Prerequisite: Music 163; junior standing. BOWEN.

**381. French Diction.** Principles of French pronunciation applied to French vocal literature. Class and individual clinical analysis and practice. II; 1 hour, or ¼ unit. Prerequisite: Music 380; junior standing, or consent of instructor. BOWEN.

**382. Senior Diction.** Preparation for senior recital; review of English, French, Italian, and German diction; stage deportment. I; 1 hour, or ¼ unit. Prerequisite: Music 381; senior standing. BOWEN.

**383. Senior Diction.** Preparation for senior recital; review of English, French, Italian, and German diction; stage deportment. II; 1 hour, or ¼ unit. Prerequisite: Music 382; senior standing, or consent of instructor. BOWEN.

## NAVAL SCIENCE

*Professor:* Captain O. H. DODSON (Head of Department).
*Associate Professor:* Commander O. L. ANDREWS, JR.
*Assistant Professors:* Captain G. M. GOLLEHER; Lieutenants R. I. BOLAND, C. E. LITTLE, M. S. SNOWDEN.
*Assistants:* A. Z. BRADSHAW, G. L. HARTER, J. A. MAJCHROWICZ, W. J. PETERSEN, W. O. WEATHERS.

### COURSES FOR UNDERGRADUATES

**100. Naval Science Laboratory.** A non-credit course designed to give the N.R.O.T.C. student, through practical demonstration, a better grasp of Naval Science subjects taught in the classrooms and a working knowledge of infantry drill. I, II; no credit. ANDREWS, BOLAND, GOLLEHER, LITTLE, SNOWDEN.

**111. Naval History and Orientation.** An analysis of factors contributing to sea power and its bearing on modern naval strategy and tactics. I; 3. Prerequisite: Registration in Naval Science 100. DODSON, SNOWDEN.

**112. Naval History and Orientation.** An introduction to life and customs of the Navy. II; 3. Prerequisite: Registration in Naval Science 100. SNOWDEN.

**121. Naval Weapons.** Designed to give the student a basic understanding of the mechanisms of naval guns and the problem of fire control. I; 3. Prerequisite: Naval Science 111 and 112 desirable but not required for Naval Science students; registration in Naval Science 100. LITTLE.

**122. Naval Weapons.** Continuation of Naval Science 121. Deals with the fire control problem and the fundamentals of electronic equipment carried on board naval vessels. II; 3. Prerequisite: Naval Science 121, registration in Naval Science 100. LITTLE.

### COURSES FOR ADVANCED UNDERGRADUATES

**231. Navigation.** Designed to give the student an understanding of the theory and technique of navigation and basic tactics. I; 3. Prerequisite: Registration in Naval Science 100. BOLAND.

**232. Navigation.** Designed to further the student's knowledge of celestial and geographical navigation for ships and aircraft, and to give basic knowledge in handling formations of ships for cruising and battle conditions. II; 3. Prerequisite: Naval Science 231; registration in Naval Science 100. BOLAND.

**241. Naval Machinery and Diesel Engines.** To familiarize the student with naval marine

engineering installations and auxiliary machinery. I; 3. Prerequisite: Registration in Naval Science 100. ANDREWS.

**242. Ship Stability, Naval Justice and Leadership.** To familiarize the student with the principles of ship stability and buoyancy in the practices of damage control, acquaint him with the procedures for and the responsibility of an officer in the administration of naval justice, and to aid him in understanding the psychology of leadership. II; 3. Prerequisite: Naval Science 241 desirable but not required for Naval Science students; registration in Naval Science 100. DODSON, ANDREWS, GOLLEHER.

**291. Evolution of the Art of War.** Designed to survey the historical development of weapons, tactics, and material, and to illustrate the classic principles of war by a study of selected battles and campaigns. I; 3. Prerequisite: Naval Science 111, 112, 121, and 122 desirable but not required; registration in Naval Science 100. GOLLEHER.

**292. Basic Strategy and Tactics.** Designed to survey modern strategical and tactical principles, using contemporary historical events as illustrative material. II; 3. Prerequisite: Naval Science 291 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

**293. Amphibious Warfare.** Provides the student with a broad introduction to the specialized field of amphibious warfare. I; 3. Prerequisite: Naval Science 291 and 292 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

**294. Amphibious Warfare, Leadership, and Uniform Code of Military Justice.** A continuation of the study of various amphibious operations and the planning and tactics used in the operation; to introduce the student to the basic psychology of leadership and to develop a knowledge of leadership techniques; to acquaint the student with the procedures and the responsibility in administration of the Uniform Code of Military Justice. II; 3. Prerequisite: Naval Science 293 desirable but not required for Naval Science students; registration in Naval Science 100. GOLLEHER.

## OCCUPATIONAL THERAPY

*Associate Professor:* BEATRICE D. WADE (Director of Curriculum).

### COURSES FOR UNDERGRADUATES

**100. Occupational Therapy Orientation.** History and development of professional aspects of occupational therapy; its scope and relation to applied professions, and its function in the field of physical and mental adjustment. I, II; 2. Prerequisite: Registration in occupational therapy curriculum. WADE.

## PHILOSOPHY

*Professors:* D. W. GOTSHALK (Chairman of Department), M. H. FISCH, M. T. MCCLURE (Emeritus), J. A. NICHOLSON.
*Associate Professors:* B. J. DIGGS, C. LEWY (Visiting), A. R. TURQUETTE, F. L. WILL.
*Assistant Professors:* O. A. KUBITZ, H. M. TIEBOUT.
*Instructors:* L. LINSKY, C. W. MARSHALL.
*Assistants:* R. A. CORNETT, W. J. EMBLOM, H. HART, E. KAELIN, J. S. MINAS, NANCY N. SKEEN, D. H. WHITTIER.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours from any courses offered by the department, including Philosophy 102, 303, 306, and 321, excluding Philosophy 101 and 105.

**Minors:** Twenty hours selected from one or two of the following subjects (excluding Rhetoric 100, 101, 102, and first-year modern foreign language courses): astronomy, botany, chemistry, economics, education, English, French, geography, geology, German, Greek, history, Italian, Latin, library science, mathematics, physics, political science, Portuguese, psychology, sociology and anthropology, Spanish, and zoology. If two subjects are chosen, at least eight hours must be taken in each subject, and the subjects and courses must be approved by the philosophy department. The curriculum on international affairs and the medieval civilization studies program will be accepted as minors.

### COURSES FOR UNDERGRADUATES

**101. Introduction to Philosophy.** I, II; 3. Prerequisite: Sophomore standing. STAFF.

**102. Logic.** Reasoning, detection of fallacies, evidence. I, II; 3. Prerequisite: Sophomore standing. STAFF.

**103. Ethics and Social Policy.** An examination of the moral aspects of social problems and a survey of ethical principles formulated to validate social policy. Not open to students with credit in Philosophy 105. I; 4. Prerequisite: Sophomore standing. DIGGS.

**104. Philosophy of Democracy.** An examination of the philosophical bases of democracy and some of its opponents. II; 4. Prerequisite: Sophomore standing. DIGGS.

**105. Moral Ideas and Practice.** Not open to students with credit in Philosophy 103. I, II; 2. Prerequisite: Sophomore standing. KUBITZ.

**110. World Religions.** A survey of the leading living religions, including Hinduism, Buddhism, Taoism, Mohammedanism, Judaism, and Christianity; examination of basic texts and of philosophic theological elaborations of each religion. I, II; 3. Prerequisite: Sophomore standing. TIEBOUT.

### COURSES FOR ADVANCED UNDERGRADUATES

**200. Honors Course.** I, II; 2. Prerequisite: Senior standing. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**303. History of Greek and Roman Philosophy.** I; 4 hours, or ½ to 1 unit. Prerequisite: Junior standing, or consent of instructor. FISCH.

**304. History of Medieval Philosophy.** Lectures and readings in the history of philosophy from St. Augustine to William of Ockham. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101 or 303, or consent of instructor. DIGGS.

**306. History of Modern Philosophy.** II; 4 hours, or ½ to 1 unit. GOTSHALK.

**309. The Philosophy of Plato.** I; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101 or 303. NICHOLSON.

**311. Philosophic Ideas of the Nineteenth and Twentieth Centuries.** I, II; 3 hours, or ½ to 1 unit. FISCH, TIEBOUT.

**313. American Philosophy.** The history of philosophy in America from colonial times to the present. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

**316. Three Philosophical Poems.** Lucretius, *Of the Nature of Things;* Dante, *Divine Comedy;* Goethe, *Faust;* studied as literary expressions of three major movements in European thought: Greek naturalism, medieval supernaturalism, and modern ro-

manticism. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 101, or consent of instructor. Offered in 1953-1954 and in alternate years. FISCH.

**317. Great Books in Modern Thought.** Hume, Darwin, Marx, Freud. Reading and discussion of selected books which either have produced or themselves reflect in some important way a changed conception of man and the world. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. WILL.

**321. Ethics and Value Theory.** I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

**323. Philosophy of Art.** A discussion of the main philosophical principles of art and of outstanding contemporary philosophies of art. I; 3 hours, or ½ to 1 unit. GOTSHALK.

**324. Philosophy of Religion.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. NICHOLSON.

**326. Metaphysics.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. TIEBOUT.

**328. Philosophy of Science.** A study of some philosophical problems that have developed from modern science. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. TURQUETTE.

**330. Theory of Knowledge.** The relative acceptability of authority, intuition, and the method of hypothesis as ways of establishing belief; logical and empirical truth; pragmatism and positivism; other selected contemporary topics. II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. WILL.

**331. Analytic Philosophy.** Advanced treatment of problems of knowledge and method, and introduction to contemporary techniques of philosophical analysis. Meaning and verification; inductive and deductive method; perceptual knowledge; certainty; other selected topics. I, II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy.

**333. Symbolic Logic.** A study of the elementary principles of symbolic analysis as applied to logical problems. I; 3 hours, or ½ to 1 unit. TURQUETTE.

**334. Symbolic Logic.** A general study of the more refined methods of symbolic analysis as applied to logical problems. Particular attention is devoted to proof procedures as they relate to the question of consistency and completeness. II; 3 hours, or ½ to 1 unit. Prerequisite: Philosophy 333, or consent of instructor. Offered in 1953-1954 and in alternate years. TURQUETTE.

**336. Philosophy of Law and of the State.** II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. FISCH.

**337. Semantics.** An investigation of semantical concepts such as denoting and truth; a study of the functions of language, definition, meaning and verification, semantical paradoxes. I; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. LINSKY.

**350. Philosophy and Modern Life.** A study of the relation between philosophy and modern life, including an analysis and discussion of the philosophical principles involved in the artistic, intellectual, cultural, and social developments of the modern world. I or II; 3 hours, or ½ to 1 unit. Prerequisite: One course in philosophy. GOTSHALK.

## PHYSICAL EDUCATION

Faculty from Departments of Physical Education for Men and Physical Education for Women.

## Dance

### COURSES FOR UNDERGRADUATES

**160. Beginning Contemporary Dance.** I, II; 1. ERLANGER, FREEMAN.

**162. Advanced Contemporary Dance.** I, II; 1. Prerequisite: Physical Education for Women 106, or consent of instructor. FREEMAN.

**163. Analysis of Rhythmic Movement.** An analysis of the inherent factors of rhythm. Application of rhythmic analysis to teaching of all activity. II; 2. Prerequisite: Dance 160. COPE, ERLANGER.

**164. Dance Composition.** Theory and laboratory problems in principles of composition. Individual and group creative work in dance forms and approaches to composition. I; 2. Prerequisite: Dance 162 and 163, or consent of instructor. FREEMAN, JOHNSTON.

### COURSES FOR ADVANCED UNDERGRADUATES

**235. Square and Ballroom Dance.** Designed for men and women students majoring in physical education, recreation, and dance. Methods of teaching and directing ballroom and American square dances in school and community groups with emphasis on organization and leadership. I; 2. Prerequisite: Junior standing. ERLANGER, FREEMAN.

**236. Folk Dance.** Designed for men and women students majoring in physical education, recreation, and dance. Typical English and European folk dances with emphasis upon the teaching and directing of school and community groups. I or II; 1. Prerequisite: Junior standing, or consent of instructor. COPE.

**240. Cultural Survey of Dance.** For students specializing in dance. I or II; 2. Prerequisite: Senior standing, or consent of instructor. COPE, ERLANGER.

**241. Percussion.** Techniques in use in percussion instruments; experience in accompanying; instruction in composition and orchestration with percussion instruments. I or II; 2. Prerequisite: Dance 162, or consent of instructor. FREEMAN, JOHNSTON.

**243. Creative Rhythms for Children.** Theories and techniques of approach to the teaching of rhythms (pre-school through eighth grade). Supervised practical experience with children in this age range. I or II; 2. ERLANGER.

**244. Teaching of Dance.** Theory and practice in curriculum construction, lesson planning and teaching, dance accompaniment, and presentation of recital programs. II; 3. Prerequisite: Dance 160 and 163, or consent of instructor. ERLANGER.

**245. Dance Production Workshop.** Principles and methods involved in production. Practical experience in the development and presentation of dance programs. I or II; 3. Prerequisite: Senior standing, or consent of instructor. FREEMAN, JOHNSTON.

**246. Theory and Philosophy of Dance.** The place of dance in everyday life and in the cultural pattern. I or II; 3. ERLANGER.

## Health Education

### COURSES FOR ADVANCED UNDERGRADUATES

**280. Safety Education.** Safety in the home, on the farm, in industry, in recreation; traffic and fire safety. I, II; 2. FLORIO, SIBONS.

**281. First Aid.** Red Cross standard course in first aid. I, II; 2. HINRICHS, HUBBARD, JACKSON.

**282. Organization of School Health Programs.** School program in health service, health-

ful school living, health education, and community health service. I or II; 3. HINRICHS, HOYMAN, JACKSON, STAFFORD.

283. **Physical and Health Inspection.** Methods and materials of determining deviations from normal. I, II; 2. BOYS.

284. **Driver Education.** Cause and extent of highway accidents; highway laws and regulations; methods of teaching driving; and psychophysical testing. Students meet in class two hours a week and in small groups in dual control car one hour a week. I, II; 2. FLORIO, SIBONS.

287. **Field Work in Community Health.** Visitation, observation, and study of local community health programs. I, II; 2. STAFFORD.

288. **Principles of Health Education.** History, scope, needs, and principles underlying the school health program. I, II; 3. HINRICHS, HOYMAN, JACKSON, STAFFORD.

## Recreation

### COURSES FOR UNDERGRADUATES

170. **Outdoor Recreational Sports.** Soccer, touch football, volleyball, softball, speedball. I, II; 2. BREEN.

171. **Indoor Recreational Sports.** Badminton, handball, paddle tennis, squash racquets, table tennis, weight lifting. I, II; 2. BREEN.

174. **Camp Counseling.** Objectives, administration, techniques, activity programs, evaluation. I, II; 3. GARRET, KENNEY, RANDALL, WAGNER.

176. **Principles of Recreation.** History of leisure and recreation; concepts of play and recreation; major recreation agencies. I, II; 3. BRIGHTBILL, ROBERTSON, SAPORA.

### COURSES FOR ADVANCED UNDERGRADUATES

235. **Design of Recreation Areas.** Same as Landscape Architecture 235. Analysis of planning standards for play fields, playgrounds, beaches, picnic grounds, camp sites, etc. I, II; 2. KEITH.

270. **Social Recreation Activities.** Purpose, techniques of leadership, and practice in social play activities. I, II; 2. ROBERTSON.

271. **Organization of Sports Programs.** Organization of varsity, intramural, and recreational sports programs. I, II; 3. SEIDLER, WAGNER.

272. **Organization of Aquatic Programs.** History of aquatics; leadership training methods; swimming pool sanitation; pool and beach operational records. I, II; 2. BULLOCK, POHNDORF.

274. **Introduction to Outdoor Education and Recreation.** Philosophy and principles; programs and methods used by various types of institutions; field experience. I, II; 3. RANDALL.

275. **Organization of Recreation Programs.** Public and private agency programs; leadership; activities; facilities. I, II; 3. ROBERTSON, SAPORA.

278. **Recreation Field Work.** Directed experience in public and private recreational programs. Students meet in class one hour each week and work with an assigned program six hours each week. I; 3. Prerequisite: Senior standing. ROBERTSON, SAPORA.

279. **Recreation Field Work.** Directed experience in public and private recreational programs. Students meet in class one hour each week and work with an assigned program six hours each week. II; 3. Prerequisite: Senior standing. ROBERTSON, SAPORA.

# PHYSICAL EDUCATION FOR MEN

*Professors:* S. C. Staley (Head of Department), C. K. Brightbill, T. K. Cureton, H. S. Hoyman, C. O. Jackson, D. R. Mills, G. T. Stafford.
*Associate Professors:* F. E. Boys, R. Eliot, B. A. Ingwersen, R. H. Johnson, H. E. Kenney.
*Assistant Professors:* H. J. Braun, H. A. Combes, R. E. Fletcher, A. E. Florio, R. V. Ganslen, A. W. Hubbard, W. J. Huffman, L. T. Johnson, B. R. Patterson, H. C. Paterson, A. V. Sapora, R. E. Shelton.
*Associate:* E. J. Manley.
*Instructors:* J. L. Breen, M. H. Eyler, M. R. Garret, R. B. King, A. B. Klingel, T. F. Krizan, P. E. Meadow, E. D. Michael, R. I. Miller, A. C. Moore, G. C. Moore, T. J. Nugent, R. H. Pohndorf, C. P. Pond, A. H. Seidler.
*Assistants:* J. R. Adams, L. Agase, E. W. Armer, B. L. Beck, R. R. Boissy, J. S. Bosco, M. C. Brewer, G. J. Casey, E. G. Cheever, R. C. Dethy, J. Eloff, W. B. Geistweit, L. A. Golding, J. P. Gorman, Mary D. Gray, R. K. Houston, P. W. Hyde, W. G. Johnson, R. T. LeFort, G. A. Logan, C. C. Luther, M. G. Maetozo, A. F. Maley, M. J. Marks, E. I. Marx, C. G. Purvis, R. P. Olson, R. A. Peterson, R. H. Rochelle, C. N. Seng, G. D. Sibons, O. Siegel, W. N. Storm, S. Sucic, C. W. Thompson, W. Van Huss, W. J. Vohaska, F. E. Ware.

### SERVICE COURSES FOR UNDERGRADUATES

**101. Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. Shelton and others.

**102. Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. Shelton and others.

**103. Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; 1. Shelton and others.

**104. Prescribed Exercise.** Prescribed ameliorative exercises adapted to individual needs, capacities, and interests. I, II; Shelton and others.

**106. Developmental Activities.** Activities that contribute to the development and maintenance of physical fitness. I, II; 1. Van Huss and others.

**108. Beginning Swimming.** Skills, knowledge, attitudes, and conditions. I, II; 1. Open only to non-swimmers. Krizan and others.

**109. Advanced Swimming.** Skills, knowledge, attitudes, and conditions. I, II; 1. Prerequisite: Ability to swim 100 yards. Paterson and others.

**110. Life Saving.** Skills, knowledge, attitudes, and conditions. I, II; 1. Prerequisite: Ability to swim three strokes for 100 yards each. Paterson and others.

**112. Individual Tumbling Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. Pond and others.

**113. Double Tumbling Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. Eloff.

**114. Apparatus Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. Armer and others.

**115. Circus Stunts.** Skills, knowledge, attitudes, and conditions. I, II; 1. Pond.

**117. Boxing.** Skills, knowledge, attitudes, and conditions. I, II; 1. Brewer and others.

**118. Wrestling.** Skills, knowledge, attitudes, and conditions. I, II; 1. Beck and others.

**119. Foil Fencing.** Skills, knowledge, attitudes, and conditions. I, II; 1. Garret.

**120. Personal Defense Activities.** Skills, knowledge, attitudes, and conditions. I, II; 1. Seidler and others.

122. **Individual Athletics.** Skills, knowledge, attitudes, and conditions. I, II; 1. MILLER.

123. **Weight Lifting.** Skills, knowledge, attitudes, and conditions. I, II; 1. SIBONS and others.

124. **Track and Field Athletics.** Skills, knowledge, attitudes, and conditions. I, II; 1. R. I. MILLER and others.

125. **Flicker Ball and Beginning Ice Skating.** Skills, knowledge, attitudes, and conditions. I, II; 1. AGASE and others.

127. **Softball and Advanced Ice Skating.** Skills, knowledge, attitudes, and conditions. I, II; 1. GORMAN and others.

128. **Soccer.** Skills, knowledge, attitudes, and conditions. I, II; 1. ROCHELLE and others.

129. **Volleyball.** Skills, knowledge, attitudes, and conditions. I, II; 1. SUCIC and others.

132. **Archery.** Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE and others.

133. **Squash Racquets.** Skills, knowledge, attitudes, and conditions. I, II; 1. MICHAELS and others.

134. **Handball.** Skills, knowledge, attitudes, and conditions. I, II; 1. MICHAELS and others.

135. **Tennis.** Skills, knowledge, attitudes, and conditions. I, II; 1. BRAUN and others.

136. **Badminton.** Skills, knowledge, attitudes, and conditions. I, II; 1. BRAUN and others.

137. **Bowling and Bait or Fly Casting.** Skills, knowledge, attitudes, and conditions. I, II; 1. KRIZAN.

138. **Golf.** Skills, knowledge, attitudes, and conditions. II; 1. BRAUN.

139. **Backyard Sports.** Sports and related activities requiring only limited facilities and equipment. I, II; 1. HYDE.

142. **Ballroom Dance.** Same as Physical Education for Women 142. Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE.

143. **American Square Dance.** Same as Physical Education for Women 143. Skills, knowledge, attitudes, and conditions. I, II; 1. MOORE.

### PROFESSIONAL COURSES FOR UNDERGRADUATES

150. **Professional Orientation.** Introduction to the fields of physical education, health, safety, recreation, dance. I, II; 2. BREEN, FLORIO, JOHNSON, KENNEY, SAPORA.

151. **Beginning Basketball.** Introductory skills, rules, and strategy. I, II; 2. BRAUN, FLETCHER, KING.

152. **Beginning Football.** Introductory skills, rules, and strategy. I, II; 2. FLETCHER, INGWERSEN, KING.

153. **Physical Conditioning Programs.** Physical fitness tests; calisthenics, medicine ball, bulldozer, grass, all-out and locomotor exercise; leadership technics. To be taken with Physical Education for Men 154. I, II; 2. POHNDORF, SEIDLER.

154. **Swimming.** Crawl, back, breast, and side strokes; diving; life saving. To be taken with Physical Education for Men 153. I, II; 2. S; 1. KLINGEL, PATERSON.

155. **Gymnastics.** Tumbling and apparatus stunts. I, II; 2. POND.

156. **Track and Field.** Track events and field events; rules. I, II; 2. L. T. JOHNSON.

166. **Games for Children.** Same as Physical Education for Women 166. Games for classroom, playground, and gymnasium. Programs, lesson planning, and source materials. I, II; 2. DROM.

### PROFESSIONAL COURSES FOR ADVANCED UNDERGRADUATES

**204. Organization of Physical Education.** Organization of the high school program in physical education. I, II; 3. JACKSON, R. H. JOHNSON.

**205. Tests and Measurements in Health, Physical Education, and Recreation.** Body type, organic, body mechanics, motor fitness, physical ability, and knowledge tests. I, II; 3. HUBBARD, POHNDORF.

**206. Kinesiology.** Mechanics and muscular action of balance and movement of the human body. I, II; 3. Prerequisite: Physiology 104 and 105. GANSLEN.

**207. Training Techniques.** Diagnostic procedures, massage, taping, bandaging, hydrotherapy, electrotherapy, handling emergency conditions, training quarters, facilities, and hygiene. I, II; 2. SHELTON.

**208. Theory of Prescribing Exercise.** Prescription and conduct of recreational and exercise programs for selected physical handicaps. Practical experience with assigned cases. I, II; 3. Prerequisite: Physiology 104 and 105. SHELTON.

**209. History of Sport and Physical Education.** Development of sport and physical education in Europe and the United States since 1750. I, II; 2. A. C. MOORE.

**210. Inspection Trip.** Visitation and inspection of physical education, health, safety, and recreation programs in public and private institutions. II; no credit. JACKSON.

**212. Advanced Football and Basketball.** Offensive and defensive strategy, training drills. II; 2. Prerequisite: Physical Education for Men 151 and 152. COMBES, ELIOT.

**215. Baseball.** Skills, rules, and strategy. I; 2. EILBRACHT.

**216. Wrestling, Boxing, Fencing.** Skills, rules, and strategy. I; 2. PATTERSON.

**217. Theory of Coaching.** Basketball, football, and baseball schedule making; team management, scouting, and officiating. I; 3. S; 2. MILLS.

**220. Physical Education for the Classroom Teacher.** Same as Physical Education for Women 220. Methods and materials in physical education applicable to all grade levels. I, II; 2. DROM.

**221. Supervision of Physical Education in Elementary Schools.** Same as Physical Education for Women 221. Purposes, methods, and materials. I, II; 2. DROM.

## PHYSICAL EDUCATION FOR WOMEN

*Professors:* LAURA J. HUELSTER (Head of Department), LOUISE FREER (Emerita).
*Associate Professor:* CARITA ROBERTSON.
*Assistant Professors:* MARGARET ERLANGER, NANCY HOUSTON, ANN E. JEWETT, M. FLORENCE LAWSON (Emerita), ENID SCHNAUBER.
*Instructors:* JO ANNE BOOKER, DORIS L. BULLOCK, IONE J. COPE, BEULAH DROM, B. JOHNSTON, HELEN WAGNER.
*Assistants:* VIRGINIA FREEMAN, LILLIAN HITE, ANNELIS JENSEN, MARJORIE L. MILES, FRANCES M. MILLER, LORRAINE M. NIELSEN.

### SERVICE COURSES FOR UNDERGRADUATES

**100. Conditioning Activities.** I, II; 1. HOUSTON, JENSEN, MILLER.

**101. Individual Gymnastics.** Recommendation from the Department of Health Service is necessary for registration in this course. I, II; 1. SCHNAUBER.

**102. Modified Activities.** Prescribed recreational sports, relaxation, and exercise. Recommendation from the Department of Health Service is necessary for registration in this course. I, II; 1. SCHNAUBER.

**105. Elementary Rhythms.** I, II; 1. COPE, ERLANGER, FREEMAN.

**106. Intermediate Rhythms.** I, II; 1. Prerequisite: Physical Education for Women 105, or consent of instructor. COPE, ERLANGER, FREEMAN.

**110. Elementary Swimming.** I, II; 1. BULLOCK, JENSEN, MILES, MILLER, NIELSEN.

**111. Sub-Intermediate Swimming.** For those whose skill is not sufficient to permit registration in intermediate swimming. I, II; 1. BULLOCK, JENSEN, MILES, MILLER, NIELSEN.

**112. Intermediate Swimming.** I, II; 1. BULLOCK, MILLER, NIELSEN.

**113. Advanced Swimming.** I or II; 1. Prerequisite: Physical Education for Women 112, or equivalent. BULLOCK, MILLER.

**114. Life Saving.** I, II; 1. Prerequisite: Physical Education for Women 112, or equivalent. MILLER, NIELSEN.

**115. Synchronized Swimming.** I; 1. Prerequisite: Physical Education for Women 112. BULLOCK, NIELSEN.

**116. Diving.** I or II; 1. Prerequisite: Physical Education for Women 112, or consent of instructor. BULLOCK.

**120. Hockey.** I, II; 1. WAGNER.

**121. Soccer.** I, II; 1. HITE.

**122. Speedball.** I, II; 1. HITE, MILES.

**123. Basketball.** I, II; 1. BOOKER, MILES, WAGNER.

**124. Volleyball.** I, II; 1. HITE, MILES, MILLER, NIELSEN.

**125. Softball.** I, II; 1. BOOKER, WAGNER.

**130. Badminton.** I, II; 1. BULLOCK, MILLER.

**131. Golf.** I, II; 1. BULLOCK.

**132. Bowling.** I, II; 1. DROM, HITE, HOUSTON, MILLER, NIELSEN.

**133. Fencing.** I, II; 1. BOOKER.

**134. Ice Skating and Tennis.** I, II; 1. HOUSTON, ROBERTSON.

**135. Archery.** I, II; 1. HITE, SCHNAUBER.

**136. Tennis.** II; 1. HOUSTON, NIELSEN, WAGNER.

**137. Recreational Sports.** I, II; 1. MILES.

**142. Ballroom Dance.** Same as Physical Education for Men 142. I, II; 1. NIELSEN.

**143. American Square Dance.** Same as Physical Education for Men 143. I, II; 1. ERLANGER, FREEMAN, NIELSEN.

**145. Advanced Basketball.** I, II; 1. Prerequisite: Physical Education for Women 123 or consent of instructor. BOOKER.

**146. Advanced Ice Skating and Tennis.** I, II; 1. Prerequisite: Physical Education for Women 134 or consent of instructor. HOUSTON.

**147. Advanced Tennis.** II; 1. Prerequisite: Physical Education for Women 136 or consent of instructor. ROBERTSON.

**148. Advanced Volleyball.** I, II; 1. Prerequisite: Physical Education for Women 124 or consent of instructor. MILES.

### PROFESSIONAL COURSES FOR UNDERGRADUATES

**150. Professional Orientation.** Introduction to the fields of physical education, health, safety, recreation, dance. I, II; 2. HOUSTON.

**151. Body Mechanics and Gymnastics.** Skill in fundamental body movements, posture, and physical conditioning. I, II; 1. DROM, HOUSTON, SCHNAUBER.

**152. Basketball and Softball.** Skills, rules, team tactics. II; 1. BOOKER, WAGNER.

**153. Soccer and Volleyball.** Skills, rules, team tactics. I; 1. MILES, ROBERTSON.

**154. Tumbling and Apparatus.** Skills and stunts. II; 1. DROM, HOUSTON.

**155. Bowling and Tennis.** Skills, rules, tactics. II; 1. DROM, ROBERTSON.

**165. Teaching of Swimming.** II; 2. Prerequisite: Sophomore or junior standing; Physical Education for Women 112. BULLOCK.

**166. Games for Children.** Same as Physical Education for Men 166. Games for classroom, playground, and gymnasium. Programs, lesson planning, and source materials. I, II; 2. DROM.

### PROFESSIONAL COURSES FOR ADVANCED UNDERGRADUATES

**200. Speedball and Hockey.** Skills, rules, team tactics. I; 1. HOUSTON, MILES, WAGNER.

**201. Badminton.** Skills, rules, team tactics. I, II; 1. WAGNER.

**202. Archery and Golf.** Skills, rules, tactics. II; 1. BULLOCK, SCHNAUBER.

**204. Organization of Physical Education.** Organization of the high school program in physical education. I, II; 3. Prerequisite: Senior standing. JEWETT.

**205. Tests and Measurements in Health, Physical Education, and Recreation.** Body type, organic, body mechanics, motor fitness, physical ability, and knowledge tests. I or II; 3. Prerequisite: Junior or senior standing. BOOKER.

**206. Kinesiology.** Mechanics and muscular action of balance and movement of the human body. I or II; 3. Prerequisite: Physiology 104 and 105; junior standing. HUELSTER.

**208. Theory of Prescribing Exercise.** Prescription and conduct of recreational and exercise programs for selected physical handicaps. I or II; 3. Prerequisite: Physical Education for Women 206. SCHNAUBER.

**209. History of Sport and Physical Education.** Development of sport and physical education in Europe and the United States since 1750. I or II; 2. Prerequisite: Junior standing, or consent of instructor. BOOKER.

**210. Inspection Trip.** Visitation and inspection of physical education, health, safety, and recreation programs in public and private institutions. II; no credit. JEWETT.

**213. Teaching of Sports.** Lectures, assigned readings, and practice teaching in University physical education classes. I; 4. Prerequisite: Physical Education for Women 151, 152, 153, 155, or consent of instructor; junior standing. BOOKER, ROBERTSON, WAGNER.

**214. Teaching of Sports.** Lectures, assigned readings, and practice teaching in University physical education classes. II; 4. Prerequisite: Physical Education for Women 151, 152, 153, 155, or consent of instructor; junior standing. BOOKER, ROBERTSON, WAGNER.

**215. Games and Sports for High School Girls.** Program planning and techniques. S; 2. ROBERTSON.

**220. Physical Education for the Classroom Teacher.** Same as Physical Education for Men 220. Methods and materials in physical education applicable to all grade levels. For non-physical education students. I, II; 2. Prerequisite: Junior standing. DROM.

**221. Supervision of Physical Education in Elementary Schools.** Same as Physical Education for Men 221. Purposes, methods, and materials. I, II; 3. DROM.

# PHYSICS

*Professors:* F. W. Loomis (Head of Department on leave), G. M. Almy, (Acting Head of Department), J. Bardeen, J. H. Bartlett, G. Bernardini, A. O. Hanson, D. W. Kerst, P. G. Kruger, A. Longacre, E. M. Lyman, R. J. Maurer, R. E. Meagher, A. T. Nordsieck, E. G. Segrè (Visiting), F. Seitz, C. W. Sherwin.

*Associate Professors:* J. S. Allen, R. A. Becker, J. M. Blatt, G. F. Chew, R. B. Duffield, R. D. Hill, R. I. Hulsizer, J. S. Koehler, R. F. Paton, C. S. Robinson.

*Assistant Professors:* P. Axel, W. K. Jentschke, L. S. Lavatelli, D. Lazarus, D. E. Mapother, P. M. Marcus, F. R. Metzger, R. D. Rawcliffe, C. P. Slichter, J. N. Snyder.

*Instructors:* G. Ascoli, E. B. McNeil, J. H. Smith.

*Associates:* J. S. Blair, D. L. Dexter, P. G. Gibbs, R. J. Gnaedinger, E. L. Goldwasser, R. F. Greene, W. R. Heller, L. Hsiao, L. J. Koester, A. W. Overhauser, E. A. Pearlstein, L. M. Slifkin.

*Assistants:* H. E. Anderson, J. F. Aschner, M. Q. Barton, D. N. Beshers, G. R. Briggs, H. N. Brown, W. A. Butler, T. R. Carver, J. F. Cochran, H. G. Cooper, H. S. Dunkerley, D. B. Dutton, F. S. Eby, P. D. Edwards, R. D. Erickson, P. C. Fisher, D. H. Fraembs, M. H. Friedman, M. Garber, S. Gartenhaus, F. H. Giles, M. Glaubman, R. F. Goodrich, D. F. Griffing, P. J. Haigh, R. R. Hake, J. W. Henderson, F. G. Hess, D. F. Holcomb, B. B. Houston, A. C. Juveland, M. H. Kalos, J. W. Kauffman, D. J. Knecht, W. E. Kreger, A. B. Kuper, J. S. Lawson, J. E. Leiss, W. Z. Lemnios, D. B. Lichtenberg, H. Lustig, C. A. Mackliet, J. H. Malmberg, D. R. Maxson, R. C. Miller, T. N. Morgan, B. H. Muller, R. Nilson, T. S. Noggle, F. S. Palubinskas, A. S. Penfold, R. G. Pohl, D. Reiner, M. E. Remley, J. K. Robe, T. R. Robillard, W. H. Robinson, R. A. Rubenstein, D. Schiff, A. H. Schoen, W. W. Schriever, R. T. Schumacher, F. J. Shore, S. Singer, E. Sonder, A. Sosin, L. P. Stephenson, S. Teitler, J. O. Thompson, C. T. Tomizuka, W. O. Unruh, E. A. Whalin.

## REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in physics including Physics 321, 341, and 342, and excluding courses with numbers lower than 270.

**Minors:** Twenty hours in one or two of the following subjects, with not less than eight hours in each if two are chosen: astronomy, chemistry, education, geology, mathematics, zoology, or any one branch of engineering.

For undergraduate students taking advanced work or a major in physics, the following courses are suggested: First year: Trigonometry and analytic geometry. Second year: Physics 103, 104, and calculus. Third year: Physics 281, 321, 322, 341, 342, 343, and 360. Fourth year: Physics 344, 371, 372, 373, 374, 381, and 382.

Physics 101 and 102 are recommended to premedical, predental, and architecture students not specializing in physics, mathematics, chemistry, or engineering.

The general physics prerequisite for certain courses may be satisfied by either Physics 103 and 104 or Physics 101 and 102. The calculus prerequisite may be satisfied either by Mathematics 132 and 142 or Mathematics 137 and 147.

Physics 351 and 352 are recommended for students in zoology, physics, and chemistry who expect to do advanced undergraduate or graduate work in biophysics or biochemistry.

## COURSES FOR UNDERGRADUATES

**101. General Physics (Mechanics, Heat, and Sound).** Lectures with demonstrations, recitations, and laboratory. For students in arts and sciences and architecture. I; 5. Prerequisite: Trigonometry. Paton and others.

**102. General Physics (Light, Electricity, and Magnetism).** Lectures with demonstrations, recitations, and laboratory. For students in arts and sciences, and architecture. II; 5. Prerequisite: Physics 101. Paton and others.

**103. General Physics (Mechanics, Heat, and Sound).** Lectures with demonstrations, recitations, and laboratory. For students in engineering, mathematics, physics, and chem-

istry. I, II; 5. Prerequisite: Registration in Mathematics 132 or 137. SLICHTER, SNYDER, and others.

104. **General Physics (Electricity, Magnetism, Light, and Modern Physics).** Lectures with demonstrations, recitations, and laboratory. For students in engineering, mathematics, physics, and chemistry. I, II; 5. Prerequisite: Physics 103. SLICHTER, SNYDER, and others.

### COURSES FOR ADVANCED UNDERGRADUATES

232. **Physics of Music.** Primarily for students majoring in music. Wave motion; factors determining pitch and loudness; temperament and harmony; interference; tone quality, harmonic analysis, synthesis of tones; evaluation of instruments and reproducing devices; mechanism of speech and singing; mechanisms of hearing; pitch and loudness discrimination; acoustics of rooms and halls. I, II; 2 hours, or ½ unit. Only students majoring in music or speech may obtain graduate credit for this course. Prerequisite: Two years of high school mathematics. MCNEIL.

260. **Elementary Heat.** Lectures and recitations. Primarily for students in ceramics. Temperature measurement, specific heats, theory of heat transfer, thermal stresses. Elementary thermodynamics as applied to equilibrium phenomena. II; 3. Prerequisite: General physics and calculus. PATON.

270. **Intermediate Light.** Lectures and laboratory. Wave motion, lenses, optical instruments, interference, diffraction, polarized light. I, II; 3 hours, or ½ unit for graduate students in the biological sciences. Prerequisite: General physics and calculus. RAWCLIFFE.

281. **Intermediate Atomic Physics.** Elementary particles, radiation, simple spectro and relation to extranuclear structure, radioactivity, nuclear processes. I, II; 3. Prerequisite: General physics and calculus. BECKER, HILL.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

321. **Theoretical Mechanics.** Lectures and problems. Physics 321 and 322 are fundamental to many advanced courses and should be elected as early as possible by those intending to specialize in physics. Laws of motion, vectors, statics, energy and momentum principles for a particle and for systems of particles, motion of a particle under constant forces, plane motion of a rigid body, simple harmonic motion and resonance, impact. I, II; 3 hours, or 1 unit. Prerequisite: General physics and calculus. ASCOLI, SLICHTER.

322. **Theoretical Mechanics.** Continuation of Physics 321. Motion of a particle under a variable force, central field motion, accelerated reference systems, motion of a particle subject to constraints, rotation of a rigid body, dimensions, vibrating systems and normal coordinates, generalized coordinates. I, II; 3 hours, or 1 unit. Prerequisite: Physics 321. ASCOLI, SLICHTER.

330. **Sound.** Lectures and problems. Fundamentals of wave motion as related to sound and vibration; propagation, reflection, refraction, interference, and diffraction of sound; production and properties of sound waves and musical tones. Some applications of sound theory; musical instruments, recording and reproduction; the ear, signaling devices, and architectural acoustics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus. BECKER.

341. **Electricity and Magnetism.** Lectures, problems, and laboratory. This course is fundamental to advanced courses and should be elected as early as possible by those intending to specialize in physics. Fundamental laws logically developed and summarized in Maxwell's equations. Forces and energies associated with electric and magnetic properties of matter. Generation and propagation of electromagnetic waves. I; 4 hours, or 1 unit. Prerequisite: General physics and calculus. HANSON and others.

342. **Electricity and Magnetism.** Continuation of Physics 341. Boundary conditions and special methods in boundary value problems. Interpretation of dielectric and mag-

netic properties of matter from the point of view of atomic and crystalline properties. Use of complex notation in circuit problems. Coupled circuits. Non-linear circuits, transmission lines. Radiation from antennas. Transmission and reflection of electromagnetic waves. II; 4 hours, or 1 unit. Prerequisite: Physics 341. HANSON and others.

**343. Vacuum Tube Circuits.** Lectures, problems, and laboratory. Elementary theory and applications of vacuum tubes as linear circuit elements in amplifiers and electronic instruments. Emphasis on experimental techniques. II; 4 hours, or 1 unit. Prerequisite: Physics 341. AXEL and others.

**344. Vacuum Tube Circuits.** Continuation of Physics 343. Electronic instruments and techniques used in research in physics. Advanced theory and experiments emphasizing the use of vacuum tubes as non-linear circuit elements: multi-vibrators, blocking oscillators, pulse generators, and amplifiers; Geiger counter circuits, synchronizing and time-measuring circuits. Familiarization with instruments and techniques used in research in physics. I; 4 hours, or 1 unit. Prerequisite: Physics 343, or equivalent. AXEL and others.

**351. Biophysics.** Lectures and recitations. The nature of living systems: cells, chromosomes, and the reproductive cycle; interaction of light and living matter; photochemical processes, bioluminescence, photosynthesis; transport processes: diffusion, electrolytic migration, electrode phenomena, permeability of living membranes, osmosis and growth. I; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. BARTLETT.

**352. Biophysics.** Continuation of Physics 351. The mechanism of nerve conduction; structure of fibrous proteins as determined with the aid of X-rays and with polarized light; the mechanism of muscular contraction; the mechanism of vision: neutral response, dark adaptation, color receptors; analysis of the functioning of the central nervous system and comparison with the operation of a high-speed computing machine. II; 3 hours, or 1 unit. Prerequisite: Physics 351, or consent of instructor. BARTLETT.

**354. Biophysics Laboratory.** Laboratory experiments in optics, electricity, and nuclear physics designed to familiarize the student with the physical apparatus and techniques useful in biophysics. II; 3 hours, or 1 unit. Prerequisite: General physics and calculus; consent of instructor. RAWCLIFFE.

**360. Heat and Thermodynamics.** A lecture and problem course. Heat transfer. Definition and application of the thermodynamic functions. First and second laws of thermodynamics. Cyclic processes, equilibrium, thermal radiation, low temperature physics, the third law of thermodynamics. II; 3 hours, or 1 unit; 2 hours, or ½ unit for students who have credit for Physics 260. Prerequisite: General physics and calculus. MAPOTHER.

**362. Kinetic Theory and Statistics.** A lecture and problem course presenting the fundamentals of kinetic theory and an introduction of classical and quantum statistical mechanics. Topics covered include equations of state, the distribution law, viscosity, thermal conduction, diffusion, Boltzmann statistics, the methods of Gibbs, Bose-Einstein and Fermi-Dirac statistics. Applications are discussed. I, II; 3 hours, or 1 unit. Prerequisite: Physics 360, or consent of instructor. MAPOTHER.

**371. Light.** Lectures, problems, and laboratory. Geometrical optics including image formation, thick lenses, aberrations, photometry of optical systems, optical instruments. Wave optics through interference and diffraction. I; 4 hours, or 1 unit. Prerequisite: General physics and calculus. ALMY, RAWCLIFFE, and others.

**372. Light.** Continuation of Physics 371. Electromagnetic character of light. Maxwell's equations, theory of reflection and refraction, polarization, double refraction, crystal optics, dispersion, scattering, optical properties of metals. II; 2 hours, or ½ unit. Prerequisite: Physics 371. ALMY.

**374. Light Laboratory.** To accompany Physics 372, and continue laboratory work of Physics 371. Experiments in interferometry, diffraction, polarization, photographic processes, and spectroscopy. II; 2 hours, or ½ unit. Prerequisite: Registration in Physics 372 or consent of instructor. RAWCLIFFE and others.

381. **Atomic Physics.** Lectures and problems giving an introduction to the structure of atoms and molecules. Experimental background, fundamental constants, electrons, photons, X-rays, atomic spectra and the Bohr theory, periodic table, introduction to the Schrödinger equation, molecular spectra, nature of chemical bonds. I; 3 hours, or 1 unit. Prerequisite: General physics and calculus. BARDEEN.

382. **Radioactivity and Nuclear Physics.** A lecture and problem course presenting our modern knowledge of the properties of nuclear particles, natural and artificial radioactivity, laboratory equipment for producing and studying high energy particles, nuclear disintegrations, the interaction of nuclear particles with each other and with matter, cosmic rays, and the application of nuclear phenomena to some practical problems. II; 3 hours, or 1 unit. Prerequisite: Physics 381. AXEL.

## PHYSIOLOGY

*Professors:* R. E. JOHNSON (Head of Department), C. L. PROSSER, F. R. STEGGERDA.
*Associate Professors:* H. L. QUASTLER (on leave), A. B. TAYLOR.
*Assistant Professors:* W. P. ELHARDT, F. SARGENT.
*Instructors:* J. D. ANDERSON, P. A. STEWART, S. G. STOLPE, G. C. WICKWIRE.
*Assistants:* R. A. BERGMAN, D. BEYER, W. A. BOYD, P. O. FROMM, BARBARA J. HOWELL, A. S. LING, C. E. MELTON, A. PANDAZI, R. B. PHINNEY, J. PRAGLIN, N. J. SIDERIUS, R. N. STEARNS, V. J. WILSON, J. W. YUSKEN.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in animal physiology, of which ten or more must be from departmental courses in the advanced group. In addition, the student's program must include one semester each of vertebrate embryology, organic chemistry and physical chemistry (either Chemistry 247 or Chemistry 240 and 241), and two semesters of general physics. Calculus is recommended strongly.

The following courses may be counted toward the twenty required hours: Physiology 105, Physiological Anatomy; Animal Nutrition 301, Introduction to Animal Nutrition; Biological Sciences 332, Photobiology; Chemistry 350, Biochemistry; Entomology 323 and 324, Insect Physiology.

**Minors:** A total of twenty hours in one or two of the following: bacteriology, botany, chemistry, entomology, mathematics, physics, zoology. At least eight hours must be taken in each field if two are chosen.

### COURSES FOR UNDERGRADUATES

NOTE: Division of General Studies 131 and 132 may be substituted for a semester of physiology in satisfying prerequisites.

103. **Introduction to Human Physiology.** The functioning of the human body as a whole, and the interrelations of various organs and systems. When this course is followed by Psychology 103, the general education requirements in biological sciences are fulfilled. (Note: This course replaces Physiology 100, 101, 102, 110, and 111 and meets curricular requirements for students in home economics, speech, nursing, and engineering.) Lectures, discussion, demonstration, and laboratory. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Not open to students who have taken Physiology 104, 105, or 134. TAYLOR.

104. **Physiological Anatomy.** Physiology and anatomy of the bony structures, ligaments, and muscles of the human body. I; 5. ELHARDT.

105. **Physiological Anatomy.** Physiology and anatomy of the human body. Topics cov-

ered include: nervous system; respiration; circulation; digestion; diets, metabolism, and vitamins; endocrinology; and reproduction. II; 5. Prerequisite: Physiology 104, or consent of instructor. ELHARDT.

**106. Physiology of the Nervous System and Special Senses.** For students in speech correction and teaching of the hard of hearing. I or II; 3. Prerequisite: Sophomore standing; four hours of physiology, zoology, or general biology, including two hours of laboratory work each week. WICKWIRE.

**134. Human Anatomy and Physiology.** A study of the essentials of anatomy and physiology with special reference to the muscular and nervous systems. For students of occupational therapy and nursing. I; 5. Prerequisite: Zoology 101, or consent of instructor. WICKWIRE.

### COURSES FOR ADVANCED UNDERGRADUATES

**208. Individual Topics.** I; 3 to 5. Prerequisite: Fifteen hours of physiology; senior standing. STAFF.

**209. Individual Topics.** II; 3 to 5. Prerequisite: Fifteen hours of physiology; senior standing. STAFF.

**235. Kinesiology.** A study of the mechanics and motion of the human body emphasizing abnormal conditions and with special relation to reeducation of muscle groups. II; 3. Prerequisite: Physiology 134. WICKWIRE.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**306. Advanced Mammalian Physiology.** The significance of muscle, nerve, blood, and circulation in mammalian physiology. I; 5 hours, or 1 unit. Prerequisite: Courses totaling twenty hours in chemistry, animal biology, or both, beyond the introductory freshman courses; consent of instructor. STEGGERDA.

**307. Advanced Mammalian Physiology.** The significance of respiration, digestion, metabolism, excretion temperature regulation, and hormones in mammalian physiology. II; 5 hours, or 1 unit. Prerequisite: Courses totaling twenty hours in chemistry, animal biology, or both, beyond the introductory freshman courses; consent of instructor. STEGGERDA.

**331. Physico-chemical Biology. Part I: Radiobiology.** Same as Biological Sciences 331 and Botany 331. Action of ionizing radiations on living organisms. I; 5 hours, or 1 unit. Prerequisite: One year each of biology, physics, chemistry, and mathematics.

**333. Physico-chemical Biology. Part III: Electrobiology.** Same as Biological Sciences 333 and Botany 333. Potentials produced by and effects of potentials upon living organisms. Lectures, student reports, and demonstrations. II; 3 hours, or ¾ unit. Prerequisite: Ten hours in biology, four hours in physical chemistry, ten hours in physics. Offered in 1952-1953 and in alternate years. PROSSER.

**361. Comparative Physiology.** Same as Zoology 361. A comparison of the general physiology of different groups of animals. I; 5 hours, or 1 unit. Prerequisite: Senior standing; three semesters of animal biology; two semesters of chemistry. PROSSER.

**362. Cellular Physiology.** Same as Zoology 362. A physico-chemical analysis of biological functions common to most living cells. II; 5 hours, or 1 unit. Prerequisite: Senior standing; two semesters each of biology and general physics; three semesters of chemistry. PROSSER.

**363. Endocrinology.** Same as Zoology 363. The glands of internal secretion with special reference to the vertebrates. I annually, and II in 1953-1954 and alternate years; 5 hours, or 1 unit. Prerequisite: One semester of elementary zoology or physiology; Zoology 334, or organic chemistry; senior standing. HALL.

# PLANT PATHOLOGY

*Professors:* W. M. Bever (Chairman of Plant Pathology Committee), H. W. Anderson, L. M. Black, B. Koehler, M. B. Linford, L. Shanor, F. F. Weinard.
*Associate Professors:* D. Gottlieb, M. B. Linn, D. Powell.
*Assistant Professor:* J. W. Gerdemann.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**Botany 372. General Mycology.** Structure, classification, and identification of fungi, including those of economic importance. II; 4 hours, or 1 unit. Prerequisite: One year of botany, bacteriology, entomology, or zoology; senior standing, or consent of instructor. Shanor.

**307. Fruit Diseases.** Same as Botany 307 and Horticulture 307. Symptomatology, control measures. Laboratory and field studies of representative diseases. I; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317 or Botany 372. Offered in 1951-1952 and in alternate years. Anderson.

**308. Vegetable and Canning Crop Diseases.** Same as Botany 308 and Horticulture 308. Symptomatology, control measures. Laboratory and field studies of representative diseases. II; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317, or Botany 372. Offered in 1952-1953 and in alternate years. Linn.

**317. Plant Pathology.** Same as Agronomy 317, Botany 317, and Horticulture 317. Causes, diagnosis, and treatment of plant diseases. I; 3 hours, or ½ unit. Prerequisite: One year of plant science including Botany 100. Black.

**377. Diseases of Field Crops.** Same as Agronomy 377 and Botany 377. A study of the symptoms of the major field crop diseases, life histories of causal organisms, and methods of control. II; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317, or consent of instructor. Bever, Gerdemann.

**379. Research Methods in Plant Pathology.** Same as Agronomy 379, Botany 379, and Horticulture 379. Lectures and laboratory work on the techniques for identification of plant diseases and their causal agents; for evaluation of plant protectants; for the study of the physiology of parasitism, and methods for planning research projects, evaluating data, and preparation of manuscripts for publication. I; 3 hours, or ½ unit. Prerequisite: Plant Pathology 317; senior standing. Gerdemann, Gottlieb.

# POLITICAL SCIENCE

*Professors:* C. M. Kneier (Chairman of Department), C. A. Berdahl, R. Dangerfield, J. M. Mathews (Emeritus), C. F. Snider, F. G. Wilson.
*Associate Professors:* C. B. Hagan, V. Jobst, E. G. Lewis.
*Assistant Professors:* M. Edelman, N. F. Garvey, G. Manner, P. Monypenny, J. W. Peltason, J. A. Ranney, R. E. Scott.
*Instructor:* T. Page.
*Assistants:* S. F. Jaenke, W. C. Wimberly.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours from courses offered by the Department of Political Science. A major may include three hours of constitutional history (History 345, 346, 369, or 370).

**Minors:** Twenty hours selected from one or two of the following subjects: economics, education, geography, history, law, library science, philosophy, social work, and sociology and anthropology. At least eight hours must be taken in each subject, if two are chosen. The curriculum in international affairs or that in Latin-American studies or in medieval civilization will be accepted as a minor.

Courses 150 and 151 give a general survey of national, state, and local government in the United States. Undergraduates beginning the study of political science are advised to take, first, courses 150 and 151, and those planning for advanced work should take those courses in the sophomore year.

### COURSES FOR UNDERGRADUATES

**101. Principles and Problems of Government.** Origins and development of government; the individual and society; theories as to the purposes of government; forms of government; problems of government organization and administration; constitutions and constitution making; the legislative, administrative, and judicial process; present problems with respect to popular control, governmental power, liberty, business, agriculture, labor, general welfare, national defense, finance, foreign relations. I; 4. Designed, with Political Science 102, to satisfy the general education requirement in social science. Neither semester may be taken separately. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. Prerequisite: Sophomore standing. RANNEY.

**102. Principles and Problems of Government.** Origins and development of government; the individual and society; theories as to the purposes of government; forms of government; problems of government organization and administration; constitutions and constitution making; the legislative, administrative, and judicial process; present problems with respect to popular control, governmental power, liberty, business, agriculture, labor, general welfare, national defense, finance, foreign relations. II; 4. Designed, with Political Science 101, to satisfy the general education requirement in social science. Neither semester may be taken separately. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. Prerequisite: Political Science 101. RANNEY.

**110. Government in Illinois.** Nature and work of government; governmental units and their interrelations; the Illinois constitution and problems of revision; popular control of government; organs of state government and their work; local governments and their functions; state and local finance. Students may not receive credit for both Political Science 110 and 312. I or II; 2. Prerequisite: Sophomore standing. SNIDER.

**150. American Government: Organization and Powers.** Historical development and organization of national, state, and local governments; the federal system; national and state constitutions; civil and political rights; party system; nature, structure, powers, and procedure of legislative, executive, and judicial departments in state and nation. I, II; 3. Prerequisite: Sophomore standing. BERDAHL, EDELMAN, GARVEY, HAGAN, JAENKE, JOBST (in charge), LEWIS, MONYPENNY, PELTASON, RANNEY, SCOTT, WILSON, WIMBERLY.

**151. American Government: Functions.** Functions of national, state, and local governments; foreign relations and national defense; taxation and finance; law enforcement; police power; regulation of commerce, communications, and business; promotion of social and economic welfare; current problems. I, II; 3. Students may not receive credit for both Political Science 151, and 101 and 102. Prerequisite: Sophomore standing; Political Science 150, or consent of department. JOBST (in charge), LEWIS, MANNER, PAGE, SNIDER.

### COURSES FOR ADVANCED UNDERGRADUATES

**262. Politics and Administration.** An introduction to the problem of securing popular control of the administrative function of government. Popular control of administrative agencies through the executive and legislative branches, and influence of administrative agencies in the formation and adoption of governmental policy. I or II; 3 hours. Prerequisite: Political Science 150. MONYPENNY.

**291. Thesis and Honors Course.** I; 2 to 5. Open only to seniors whose major is political science and who have a general University average of at least 4.0 STAFF.

**292. Thesis and Honors Course.** II; 2 to 5. Open only to seniors whose major is political science and who have a general University average of at least 4.0 STAFF.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

305. **Municipal Government.** Growth of cities; their legal status; municipal politics and organization in the United States. I; 3 hours, or ½ to 1 unit. KNEIER.

306. **Municipal Problems.** Municipal administration in the United States; administrative organization; personnel problems; financial problems; city planning and housing; police and fire administration; public health; public utilities. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing with Political Science 305, or Economics 102 and 103, or six hours of political science. KNEIER.

310. **Rural Local Government.** Development of local government in rural America; state-local relationships; legal status of local units; organization and functions of counties, townships, school districts, and special-purpose districts; rural politics and elections; local finance; problems of reorganization. I or II; 3 hours, or ½ to 1 unit. SNIDER.

312. **State Government.** The states in the federal system; state constitutions and problems of revision; organization, powers, and functions of the legislative, administrative, and judicial branches of state government; reorganization problems in the states; state-local relations; state finance; trends and prospects. Students may not receive credit for both Political Science 110 and 312. I or II; 2 hours, or ½ to 1 unit. Prerequisite: Political Science 150, or equivalent. SNIDER.

315. **Legislatures and Legislation.** The legislative function in government; structure and organization of American legislatures, national, state, and local; party organization in legislatures; legislative procedure; pressure groups and lobbying; relation of legislature to other branches of government; problems of legislative reorganization. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Junior standing with six hours of political science. HAGAN.

321. **Government and the Economic Order.** A survey of public policies of national and state governments regulating economic activity; transportation, electrical utilities, communications, anti-monopoly, agriculture, level of economic activity. I; 3 hours, or ½ to 1 unit. Prerequisite: Any two courses in political science or a combination of political science and economics. HAGAN.

325. **Political Parties: Historical Development and Issues.** Nature of American party system; historical development of parties and issues; third or minor parties and their role. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

326. **Political Parties: Organization and Methods.** Organization and operation of the American party system; relations between national, state, and local organizations; state and national committees; the convention system; the primary; campaign methods and finance. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

331. **British Government.** Nature of the British constitution; the crown, ministry, and cabinet; Parliament and elections; the party system; law and the courts; local government; the British Commonwealth. I or II; 3 hours, or ½ to 1 unit. LEWIS.

336. **Continental European Governments and Politics.** An analysis of the major political systems of continental Europe; constitutional and legal structures of France, Germany, Italy, the Soviet Union, and Spain; factors in the struggle for power; political and social movements as they affect the European scene; relation of political to economic, religious, and social institutions in Europe. II; 3 hours, or ½ to 1 unit. LEWIS.

342. **Government and Politics in Latin America.** A survey of the origin and development of Latin-American political institutions; systems of government; public administrative systems; party government; international policies of Latin-American governments. I or II; 3 hours, or ½ to 1 unit. SCOTT.

343. **International Relations of Latin America.** Latin-American position and objectives in international affairs, with emphasis on the Latin-American viewpoint; the Monroe Doctrine; the Good Neighbor Policy; the Organization of American States and the United Nations; recent relations of specific nations. I or II; 3 hours, or ½ to 1 unit. SCOTT.

**345. Theory and Practice of Democratic Government.** Theories of the nature and conditions of democracy; contemporary democratic institutions compared and analyzed. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. RANNEY.

**351. American Constitutional System.** Judicial interpretation of constitution; separation of governmental powers; relation of state and national governments; control of interstate commerce; jurisdiction of courts. I; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. PELTASON.

**354. The Constitution and Industrial Legislation.** Scope of national regulatory power; commerce clause, taxing power; spending power; scope of state regulatory power; police power and due process limitations. II; 3 hours, or ½ to 1 unit. Prerequisite: Any two courses in political science, or a combination of political science and economics. PELTASON.

**356. Administrative Law in the United States.** A study of the powers of administration, of the legal requirements for and the limits on the exercise of such powers, of the internal and external means of safeguarding individual rights, and of the enforcement of the responsibility of administrative officers, both politically and legally. II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 305, 351, 354, or 361 (any one), or consent of instructor. MONYPENNY.

**359. Jurisprudence.** Nature and sources of law; law and the state; law and justice; evolution, arrangement, and subject matter of law. I or II; 3 hours, or ½ to 1 unit. Prerequisite. Political Science 150, or equivalent. MANNER.

**361. Introduction to Public Administration.** Development of administrative organization; administration and the executive, legislature, and judiciary; principles of organization, including line and staff relationships; the staff services of finance and personnel; formal and informal control. I; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. MONYPENNY.

**364. National Administration.** Creation and development of the national administrative organization; the executive departments; regulatory, service, and staff agencies; special organization for emergency and war efforts at reorganization and coordination. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of political science, including either Political Science 150 or 151. MONYPENNY.

**365. Theory and Administration of Federal Labor Law.** Same as Labor and Industrial Relations 365. Critical analysis of the relationship between group pressures on government and public policy affecting labor; role of administration in formation of policy; problems and experience of federal agencies operating in the labor fields. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 150. EDELMAN.

**368. Public Personnel Administration.** Same as Labor and Industrial Relations 368. An analysis of personnel management in government. Recruitment and selection, job and salary classification, work standards, training, and the role of labor and professional organizations in the public services considered in the light of current theory and practice. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 361, or consent of instructor. PAGE.

**371. International Organization.** General development and basic principles of world organization; principles, structure, methods, and actual operation of international governmental institutions; special attention to the League of Nations, the United Nations, and related agencies. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

**372. International Organization.** The problem of war and security; pacific settlement of disputes; the functioning of the United Nations and other international agencies in respect to economic and social problems. I or II; 3 hours, or ½ to 1 unit. BERDAHL.

**373. International Administration.** International administrative agencies; international unions and other agencies for functional purposes; organization, procedure, and personnel of international secretariats; budgets and financial administration; international territory; mandates and trusteeships. I or II; 2 hours, or ½ to 1 unit. Prerequisite: Political Science 371 or 372, or equivalent. BERDAHL.

**381. American Foreign Relations.** Participation in international affairs; presidential initiative; development and organization of the Department of State; diplomatic intercourse; consular service; treaty making power; development of foreign policy. I or II; 2 hours, or ½ to 1 unit. Prerequisite: Junior standing with six hours of political science. DANGERFIELD.

**382. Contemporary American Foreign Policies.** Study of the major foreign policy decisions currently confronting the United States government—analysis of background, principal issues, alternative actions; formulation of policies. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 381, or consent of instructor. DANGERFIELD.

**384. International Relations.** An examination of the nature of the national state system, of the forces affecting international relations, of the sources of conflicts in international politics, and of their solution by power politics or by international cooperation. I or II; 3 hours, or ½ to 1 unit. MANNER.

**385. International Law.** Nature, sources, and development of international law; rights and duties of states; law of peace and war. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing, or junior standing with six hours of political science. JOBST.

**386. International Law.** Continuation of Political Science 385. Nature, sources, and development of international law; rights and duties of states; law of peace and war. II; 3 hours, or ½ to 1 unit. Prerequisite: Political Science 385, or consent of instructor. JOBST.

**391. Principles of Political Science.** A survey and analysis of the modern state; methods of study in political science; sovereignty and the legal nature of the state; forces and interests in politics; forms of government; the nature of democracy and international society. I; 3 hours, or ½ to 1 unit. Students may not receive credit for both Political Science 101 and 102, and 151 or 391. WILSON.

**393. History of Political Theory.** A survey of the major trends and issues in European political thought from ancient times to 1850. Greek and Roman theories of politics; the development of Christian political thought and the Middle Ages; political theory during Renaissance, Reformation, and the Counter Reformation; early modern absolutism, the emergence of constitutional government, and the theory of democracy; the Enlightenment, European liberalism, conservatism, Utopianism, and pre-Marxian socialism. I or II; 3 hours, or ½ to 1 unit. WILSON.

**396. Contemporary Political Theory.** Major tendencies in Western political theory since 1850; conservatism and constitutionalism; the religious interpretation of the state and economic institutions; Marxism, socialism, and communism; antidemocratic thought and totalitarian regimes. II; 3 hours, or ½ to 1 unit. WILSON.

**397. American Political Theory.** A survey of American political thought from colonial times to the present. I; 3 hours, or ½ to 1 unit. WILSON.

### Portuguese

(See Spanish and Italian)

## PSYCHOLOGY

*Professors:* L. H. LANIER (Head of Department), R. B. CATTELL, G. D. HIGGINSON, J. M. HUNT, W. E. KAPPAUF, C. M. LOUTTIT, L. L. MCQUITTY, O. H. MOWRER, L. I. O'KELLY, R. STAGNER, H. WOODROW (Emeritus), P. T. YOUNG.

*Associate Professors:* J. B. COHEN, R. M. COLLIER, T. N. EWING, W. M. GILBERT, G. R. GRICE, T. W. HARRELL, L. A. HELLMER, W. G. MCALLISTER, C. E. OSGOOD, A. C. WILLIAMS.

*Assistant Professors:* GERTRUDE L. BATES, R. ELIZABETH BROWN, R. G. DEMAREE, S. S. DUBIN, N. H. EISEN, W. A. GIBSON, H. A. GRACE, LEOTA L. JANKE, ALICE K. JONIETZ,

R. P. Larsen, P. V. Marchetti, W. G. Matheny, D. S. Pomeroy (on leave), S. N. Roscoe, H. Rosen, G. J. Wischner.
*nstructors:* J. J. DeLucia, Kathryn G. Hansen.
*Assistants:* H. J. deHaan, D. J. Fitch, M. L. Goldstein, Esther Gould, C. O. Hopkins, S. Hutter, K. J. Kadlub, J. D. Lyons, R. L. Malone, J. W. Moffitt, E. J. Morrison, J. E. Nygaard, M. M. Okanes, D. M. Paull, R. D. Schnitzer, J. R. Skeen, A. K. Solarz, P. W. Wenig, K. Wilson.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours from courses offered by the Department of Psychology, excluding Psychology 100, 103, and 105.

**Minors:** Twenty hours chosen from not more than two of the following subjects: anthropology, economics, curriculum in international affairs, education, library science, mathematics, philosophy, physics, physiology, political science, social work, sociology, speech, and zoology. At least eight hours must be taken in each, if two are chosen.

Students who plan to do graduate work in psychology should take a laboratory course in experimental psychology and a course in statistics. It is recommended also that they take courses in the natural sciences, in the social sciences, and especially in mathematics. Intensive concentration in psychology is undesirable for the prospective graduate student. The study of French and German is strongly recommended.

### COURSES FOR UNDERGRADUATES

**100. Introduction to Psychology.** Introductory analysis and description of human behavior with special reference to observation, learning, memory, thinking, emotional life, and personality development. Major emphasis is placed upon psychological principles as they relate to daily life and everyday problems. Not open to students electing Psychology 103 or 105 and 106. I, II; 4. Prerequisite: Sophomore standing. Marchetti, McAllister, Roscoe, and others.

**103. Human Behavior.** A comprehensive introduction to facts, principles, and applications of psychology. Together with Physiology 103, this course forms an eight-hour sequence satisfying the general education requirements in biological sciences. Not open to students electing Psychology 100 or 105 and 106. I, II; 4. Prerequisite: Physiology 103. Higginson and others.

**105. Human Nature.** Biological and social determinants of human nature; development of personality; facts, principles, and applications of modern psychology. The first half of an eight-hour sequence satisfying the general education requirement in the Division of Social Sciences. Not open to students electing Psychology 100 or 103. I; 4. Young and others.

**106. Human Nature.** Biological and social determinants of human nature; development of personality; facts, principles, and applications of modern psychology. The second half of an eight-hour sequence satisfying the general education requirement in the Division of Social Sciences. Not open to students electing Psychology 100 or 103. II; 4. Prerequisite: Psychology 105. Young and others.

**130. Experimental Psychology.** Employment and understanding of experimental methods in psychology. I, II; 2. Prerequisite: Credit or registration in Psychology 100, 103, or 106. Cohen, Higginson, and others.

**135. Statistical Methods in Psychology.** Application of elementary statistical methods to psychological data. No credit for this course will be given to students who receive credit for Economics 170 or Mathematics 161. I, II; 3. Prerequisite: Psychology 100, 103, or 106. Cohen, Gibson.

**145. Industrial Psychology.** A consideration of sociopsychological principles of behavior in business and industry and of the scientific methods of investigation in this area, and a survey of specific methods of personnel technology. I, II; 3. Prerequisite:

Psychology 100, 103, or 106; credit or registration in a course in statistics. DUBIN, MARCHETTI, MATHENY.

**150. Personality and Social Behavior.** An introduction to the study of personality in relationship to the social enviornment. Application of psychological principles to social problems. I, II; 3. Prerequisite: Psychology 100 or 103. Not open to students who have had Psychology 105 and 106. BROWN, MARCHETTI, ROSEN, STAGNER.

**183. Psychology of Adjustment.** An introductory study of motivational and interpersonal relationships, with special emphasis upon frustration, conflict, and adjustment mechanisms. I, II; 3. Prerequisite: Psychology 100, 103, or 106. DELUCIA.

### COURSES FOR ADVANCED UNDERGRADUATES

**216. Child Psychology.** A study of the psychological development of the child. I, II; 3. Prerequisite: Psychology 100, 103, or 106. BROWN, DELUCIA, WISCHNER.

**220. Fields of Psychology.** A functional approach to man's psychological development and his institutionalization; the role of psychology in society, industry, law, education, and medicine. I, II; 4. HIGGINSON.

**246. Engineering Psychology.** The use of psychological data and methods of research with respect to problems of equipment design and man-machine relations. I, II; 3. Prerequisite: Psychology 100 or 103, or consent of instructor. MATHENY.

**250. Psychology of Personality.** Methods of investigating personality; biological factors in personality; the learning process and motivation as related to the development of personality; the structure of personality. I, II; 3. Prerequisite: Psychology 100 and 150, or Psychology 105 and 106. DUBIN.

**255. Social Psychology.** The systematic study of the social behavior of the individual and the group. Particular attention is given to social perception, motivation, and learning; attitudes and values; the development and dynamics of social groups; interaction among groups. I, II; 3. Prerequisite: Psychology 100 and 150, or Psychology 105 and 106. GRACE.

**290. Introduction to Psychological Tests and Measurement.** Basic concepts of psychological measurement; characteristics of a good test; interpretation of test results. Introduction to tests of intelligence, special abilities, aptitudes, achievement, personality, and interests. I, II; 3. Prerequisite: Psychology 100, 103, or 106; a course in statistics. DUBIN, GIBSON, MARCHETTI.

**291. Honors Course.** For major students and candidates for honors. I; 2. Prerequisite: Senior standing; consent of instructor. GRACE.

**292. Honors Course.** For major students and candidates for honors. II; 2. Prerequisite: Senior standing; consent of instructor. GRACE.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Physiological Psychology.** A study of the physiological basis of behavior, including sensory processes, motivation, emotion, learning, and intelligence. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology; Physiology 103 or 106, or Zoology 101.

**326. Motivation and Emotion.** The nature and development of emotion, attitude, motive, and the role of these processes in social adjustment. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology. YOUNG.

**330. Advanced Experimental Psychology.** A survey of experimental techniques and subject matter in the fields of psychophysics and measurement, sensory processes, attention and perception, motivation and emotion, learning and memory, motor activity. Lectures and laboratory. I, II; 4 hours, or ½ to 1 unit. Prerequisite: Psychology 100, 103, or 106; a course in statistics.

**338. Abnormal Psychology.** An introduction for preprofessional students to the psychological aspects of the behavior disorders, including study of the insanities, psychoneuroses, mental deficiencies, and other conditions. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology; junior standing except for those in the premedical curriculum who may take the course as second semester sophomores with four hours of psychology. O'KELLY.

**345. Comparative Psychology.** Animal behavior with particular reference to the behavior of vertebrates. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours credit in psychology, or Psychology 100, 103, or 106, and one course in zoology. MCALLISTER.

**348. The Psychology of Learning.** A survey of the basic facts and theories of the learning process. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology. GRICE.

**353. Psychology of International Relations.** Psychological insights into the problems of international relations: nationalism, war and peace, international conferences. Individual differences due to nationality differences and the problems raised by international contacts. II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100 and any one of the following: Psychology 150, Sociology 110, 212, or Anthropology 260; and, in addition, three hours of advanced courses in the international affairs curriculum. Foreign students by consent of instructor. GRACE.

**357. Psychology of Industrial Conflict.** Same as Labor and Industrial Relations 357. An analysis, in terms of the behavior of individuals, of the causes and possible solutions of industrial conflict. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 100, or equivalent; Psychology 145, or Economics 240, or Sociology 318. STAGNER.

**378. Perception.** Principles of perception; perception of space, time, and motion. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Six hours of psychology.

**383. Student Counseling.** The application of psychological principles and techniques in fitting education processes to the needs, interests, and abilities of the individual college student. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Psychology 338, a course in statistics; senior standing. EWING.

## Recreation

(See Physical Education)

## Rhetoric

(See English)

## Russian

(See French)

## Secretarial Training

(See Business Organization and Operation)

# SOCIAL SCIENCES

### COURSES FOR UNDERGRADUATES

**101. Latin-American Civilization: The Caribbean.** I; 3. HAMILTON and others.

**102. Latin-American Civilization: South America.** A survey of the history, politics, geography, economics, literature, and art of the South American area. This course is required for a minor in Latin-American studies. II; 3. HAMILTON and others.

### COURSES FOR ADVANCED UNDERGRADUATES

282. **Seminar in International Affairs.** Required during the last semester of students majoring in international affairs and restricted to seniors majoring in this area. II; 3. DANGERFIELD.

292. **Thesis and Honors.** Students majoring in international affairs and seeking to graduate with honors are required to write a thesis. This course will be required of all such students and is restricted to them. Only such majors whose general University average is 4.0 or better are eligible for this course. I, II; 2 to 4.

## SOCIAL WORK

*Professor:* MARIETTA STEVENSON (Director of School of Social Work).
*Associate Professors:* R. J. ARTIGUES, MARY L. HEMMY, RACHEL B. MARKS, EDITH L. NAGEL, FLORENCE POOLE, W. P. SIMON.
*Assistant Professors:* H. HOLLENBECK, MARJORIE W. MAIN, J. E. MCDONALD, D. KATHARINE ROGERS.
*Instructor:* MARY C. REESE.
*Lecturers:* HELEN COYLE, J. M. KENNEDY, MARY S. KUNST, VIRGINIA LEHMANN, K. NOLAN.

### COURSES FOR UNDERGRADUATES

**Minors:** Courses in social work may be counted toward a minor in the departments of Economics, Political Science, Psychology, and Sociology and Anthropology.

225. **Introduction to Social Work I.** A survey of the field of social work including the Poor Law backgrounds of current public social services; the development of social work concepts and philosophy in voluntary social agencies; the social services under the Social Security Act. I, II; 3. Prerequisite: Senior standing, or consent of instructor. ROGERS.

226. **Introduction to Social Work II.** A continuation of Social Work 225. Attention is given to changing concepts and philosophy in social work; development of special services for children; examination of agencies in which social case work is practiced, and social services to groups. I, II; 3. Prerequisite: Senior standing; Social Work 225. ROGERS.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

316. **Social Services for Children.** This course is designed to acquaint students with the unmet needs of children and the organization of social services to meet those needs. Responsibilities of voluntary as well as public agencies are considered. A survey is made of agencies providing leadership and standard setting in social services for children. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; a major in any of the social sciences, education, recreation, speech correction, or consent of instructor. ROGERS.

## SOCIOLOGY AND ANTHROPOLOGY

*Professors:* J. W. ALBIG (Chairman of Department), E. T. HILLER (Emeritus), D. E. LINDSTROM, D. R. TAFT, F. W. ZNANIECKI (Emeritus).
*Associate Professors:* J. E. BACHELDER, R. BIERSTEDT, R. DEWEY, R. DUBIN, J. E. HULETT, JR., O. LEWIS, J. C. MCGREGOR, E. H. SHIDELER, B. F. TIMMONS.
*Assistant Professors:* E. A. AHRENS, MARGARET K. CHANDLER, C. FOLSE, R. W. JANES, D. E. WRAY.

*Instructors:* T. C. Esselstyn, Eleanor P. Godfrey, Ruth A. Hudson, Max Kaplan. *Assistants:* J. Hamburger, E. S. Lucy, J. C. Osoinach, J. C. Pock, J. P. Reed, R. E. Ries, R. H. Robbins, A. A. Sio.

## Sociology

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours from any courses in the department and three hours from Philosophy 311 (preferably taken during the junior year). Sociology 104 and 105, the general education courses, will not be accepted for major credit.

**Minors:** Twenty hours from any one or two of the following subjects: anthropology, economics, history, law, philosophy, political science, psychology, and social work. At least eight hours must be taken in each subject, if two are chosen. The curriculum on international affairs will be accepted as a minor.

### COURSES FOR UNDERGRADUATES

**100. Principles of Sociology.** I, II; 3. Prerequisite: Sophomore standing. Godfrey, Hamburger, Hulett, Kaplan, Reed, Robbins, Shideler.

**104. Community and Society.** A two-semester general course introductory to sociology and anthropology. Open to freshmen and sophomores only. This course satisfies the general education requirement in the College of Liberal Arts and Sciences. Not acceptable toward a major. I; 4. Janes and others.

**105. Community and Society.** Continuation of Sociology 104. Open to freshmen and sophomores only. II; 4. Janes and others.

**110. Social Factors in Personality.** Nature of person and relation to institutions, social order, and development. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Ahrens.

**140. Social Control.** I, II; 2. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Albig.

### COURSES FOR ADVANCED UNDERGRADUATES

**212. Culture Patterns and the Individual.** Relationships between institutional structure and culture patterns and the common drives, attitudes, and other adjustive mechanisms of the group members. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. Hulett.

**220. Marriage and the Family.** The family as a social institution; its origin, nature, development, and trends. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, and junior standing; or senior standing. Godfrey, Osoinach, Timmons.

**221. Contemporary Society.** Basic character of modern life forms; underlying principles and efforts at reorientation. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; Sociology 243; junior standing. Ahrens.

**225. Racial and Cultural Minorities.** I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. Dewey.

**230. Poverty and Society.** Dependent classes; modern methods and policies in their treatment; historical perspectives. I; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. Sociology 110 and courses in history and economics are recommended. Timmons.

**243. Social Evolution.** Primitive and modern societal structures; origin and development of social institutions, processes of social change; problems of progress. I, II; 3. Pre-

requisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. AHRENS.

**270. Population and Human Ecology.** Population in relation to resources; concentration and dispersion of peoples; the internal organization of urban areas; theories and human ecology and current problems. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DUBIN.

**271. Sociology of the Region.** Regionalism in theory; concepts and factors conditioning the types of regions; regionalism in operation in its dominant forms. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DEWEY.

**276. Sociology of the City.** Study of urban structure and ecology, particularly in light of the planning movement and the urban populations; growth and development of urban communities. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing. DEWEY.

**277. Rural Sociology.** Same as Agricultural Economics 277. A study of the importance of rural life, its social problems and means of solution. The importance of a scientific study of these factors, concentrating primarily on the social aspects of physical conditions, population, occupations, the family, the neighborhood, community organizations, the church, the school, the library, adult education, local government, recreation, country life movements, and possible future trends affecting rural life. I, II; 3. Prerequisite: Junior standing. LINDSTROM.

**281. Contemporary Sociology.** Contemporary sociological theories, with emphasis upon American writers. I, II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; senior standing; major in sociology, or consent of instructor. BIERSTEDT.

**288. European Sociological Thought.** Historical evolution of objective; methodical investigation of social reality. I or II; 3. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152; junior standing.

**290. Honors Course.** Individual study or research projects. I; 2. Prerequisite: Senior standing. STAFF.

**291. Honors Course.** Individual study or research projects. II; 2. Prerequisite: Senior standing. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**315. Sociology of Education.** Same as Education 315. Objective comparative study of education as a social process in various cultures and historical periods, with main emphasis on present education in countries which share Western civilization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. SHIDELER.

**318. Human Relations in Industry.** Same as Labor and Industrial Relations 318. Sociology of industry and problems of personal adjustment. The emergence of modern industrial and labor organizations and their impact upon community life. I, II; 3 hours, or ½ unit. Prerequisite: Senior standing; Psychology 100; Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, or consent of instructor. No credit toward graduation for both Sociology 318 and Engineering 230. CHANDLER, DUBIN, WRAY.

**320. Social Roles.** Comparative study of organized participation of individuals in social life and culture. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152.

**324. Penology.** Probation; parole; methods of institutional treatment. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 331. TAFT.

**327. National Culture Societies.** A comparative sociological survey of the formation, social organization, and interaction of modern nationalities as cultural groups. I or II; 3 hours, or ½ unit.

**331. Criminology.** Crime from the point of view of personality and social situations. I, II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. Open to prelegal juniors by consent of instructor. TAFT.

**332. Prevention and Treatment of Juvenile Delinquency.** I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or 331, or Division of General Studies 151 and 152. ESSELSTYN.

**340. Social Movements.** Analysis of the factors in the formation and dynamics of social movements as collective behavior; patterns of growth, types of leaders, control mechanisms. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105. SHIDELER.

**344. Public Opinion.** Opinion changes and control; propaganda; interest groups and opinion; critical review of methods of measurement. I, II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152. ALBIG.

**347. Sociology of International Conflict.** War as a social process. Conflict of national cultures, population pressures, race relations, immigration policies, restrictions on communication and other elements in the international conflict process. Occupation policies in Germany and Japan. Implications of social science for changes in the process. II; 3 hours, or ½ unit. Prerequisite: Senior standing; Sociology 327 recommended. TAFT.

**375. Sociology of the Community.** Nature, structure, and functions of the community. Types of communities and examples of some better community studies. The relation of the community to the larger social organization. I or II; 3 hours, or ½ unit. Prerequisite: Sociology 100, or 104 and 105, or Division of General Studies 151 and 152, and senior standing; or eleven hours of sociology. TIMMONS.

**378. Acculturation in Modern Society.** I, II; 3 hours, or ½ unit. Prerequisite: Five hours of sociology. JANES.

**385. Methods of Sociological Research.** I, II; 3 hours, or ½ unit. Prerequisite: Eight hours of sociology. BIERSTEDT.

## Anthropology

### COURSES FOR UNDERGRADUATES

**107. Introduction to Anthropology.** An introduction to general anthropology covering human origins and early man; race and racism, archaeology, and the beginnings of human civilization, linguistics, and the nature of culture with examples from primitive societies. I, II; 3. Prerequisite: Sophomore standing. LEWIS, MCGREGOR.

### COURSES FOR ADVANCED UNDERGRADUATES

**251. Archaeology: New World Prehistory.** A survey of the archaeology of the new world, with brief characterization of the various cultures, familiarity with basic literature of each area, and a summary evaluation of the interrelationships of these cultures. A lecture course supplemented with individual outside reading. I, II; 3. Prerequisite: Anthropology 107, or Sociology 104. MCGREGOR.

**252. Old World Archaeology.** A review of the prehistory of the Old World, including Europe proper, north Africa, and as far east as western India. A survey from the earliest known times to the period of earliest written history. I; 3. Prerequisite: Anthropology 107, Sociology 104, or consent of instructor. MCGREGOR.

**260. Primitive Society—Introduction to Ethnology.** An introduction to comparative ethnography. Its purpose is to indicate the range and diversity in the social, economic, political, and religious institutions of primitive peoples in various parts of the world. I, II; 3. Prerequisite: Anthropology 107, or Sociology 104. LEWIS.

## COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**353. Southwestern Archaeology.** This course is a detailed study of one archaeological unit in the United States. It covers the three broad cultures with regional variations considered chronologically and stressing interrelationships of the various cultures. I or II; 3 hours, or ½ unit. Prerequisite: Anthropology 107. MCGREGOR.

**354. Field Techniques in Archaeology.** Participation in archaeological excavation; techniques, methods, and procedures discussed and practiced in actual working conditions. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; registration in Anthropology 355; consent of instructor. MCGREGOR.

**355. Laboratory Techniques and Problems in Archaeology.** Laboratory work in the field, studying, evaluating, and writing final report on preceding field work. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; consent of instructor. MCGREGOR.

**356. Physical Anthropology.** The aims and methods of physical anthropology; both osteology and somatology, with emphasis on the human skeleton. II; 3 hours, or 1 unit. Prerequisite: Anthropology 107, or Sociology 104, or a course in anatomy or comparative anatomy, or a course in introductory zoology with consent of instructor. Offered in alternate years. MCGREGOR.

**361. Ethnology of Middle America.** A survey of the peoples and cultures of Middle America with special emphasis upon Mexico and Guatemala. The course begins by placing Middle America geographically, historically, and culturally with the broader Latin-American scene. The countries are first viewed as a whole and then selected ethnographic studies with specific communities are considered for comparative purposes. The Caribbean will not be studied in this course. I or II; 3. Prerequisite: Anthropology 107, or registration in Latin-American studies curriculum. LEWIS.

**363. Religion in Primitive Society.** An introduction to the study of magic and religion in nonliterate societies; the course will consider theories of the origin and function of magic and religion and an analysis of magic and religion in representative primitive societies. II; 3 hours, or 1 unit. Prerequisite: Anthropology 107 or Sociology 104. Offered in alternate years. LEWIS.

**364. Field Work in Cultural Anthropology.** Supervised participation in field research; techniques and procedures discussed and practiced under actual working conditions. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; speaking knowledge of the language of the area concerned; concurrent registration in Anthropology 365; consent of instructor. LEWIS.

**365. Analysis of Field Data in Cultural Anthropology.** Evaluation, organization, and write-up of field data. S; 3 hours, or 1 unit. (Credit may be received twice for this course if the area or problems involved are different.) Prerequisite: Anthropology 107, or equivalent; speaking knowledge of the language of the area concerned; consent of instructor. LEWIS.

# SPANISH AND ITALIAN

**(Including Portuguese)**

*Professors:* J. Van Horne (Head of Department), A. Hamilton, H. R. Kahane.
*Associate Professors:* J. H. D. Allen, R. P. Oliver, Angelina R. Pietrangeli.
*Assistant Professors:* J. S. Flores, Albertine W. Osgood.
*Instructors:* Harriett S. Hutter, S. L. Murphy, H. P. Reeves.
*Assistants:* S. B. Adams, Raquel Andrade, R. Beym, W. Borenstein, Mary Cannizzo, Ruth L. Fosnaugh, Elvia de la Fuente, Mary García, Dorothy Gengler, Jewel Kurtz, H. D. Landrum, Carmen Manzanares, J. G. Markley, Sara de Mundo, R. W. Norton, J. A. Pettit, Evelyn Pildes, R. W. Price, Nilza C. Santos, S. Saporta, W. J. Sensing, María I. Suiffet, Verna K. Townsend, A. Triolo, J. L. Urla, Carmelina Virgilí, Jacqueline Weaver.

## Spanish

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in Spanish, excluding Spanish 101, 102, 103, 113, and 114, and including at least five hours from the group for advanced undergraduates and graduates. Humanities 301, Introduction to Linguistics, may be counted toward the major in Spanish. Either Social Science 101 or 102. Latin-American Civilization, may be counted toward the major in Spanish and is required for teacher-training majors in Spanish.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: education, English (excluding Rhetoric 101 and 102), French, German, Greek, history, Italian, Latin, Latin-American studies, library science, medieval civilization studies, philosophy, Portuguese.

### COURSES FOR UNDERGRADUATES

**101. Elementary Spanish.** For students who have no credit in Spanish. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for Spanish 101 without 102. Prospective teachers are advised to register in special sections in spoken Spanish. Murphy, Van Horne, and others.

**102. Elementary Spanish.** Continuation of Spanish 101. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Spanish 101, or one year of high school Spanish. Prospective teachers are advised to register in special sections in spoken Spanish. Murphy, Van Horne, and others.

**103. Intermediate Spanish.** Rapid reading, review of grammar, composition, conversation. I, II; 4. Prerequisite: Spanish 102, or two years of high school Spanish, Murphy, Van Horne, and others.

**104. Intermediate Spanish.** Continuation of Spanish 103. I, II; 4. Prerequisite: Spanish 103, or three years of high school Spanish. Murphy, Van Horne, and others.

**113. Elementary Composition and Conversation.** May be taken concurrently with Spanish 103. Does not count toward the major in Spanish. I, II; 2. Prerequisite: Spanish 102, or two years of high school Spanish. Reeves and others.

**114. Elementary Composition and Conversation.** May be taken concurrently with Spanish 104. Does not count toward the major in Spanish. I, II; 2. Prerequisite: Spanish 113, or equivalent. Reeves and others.

### COURSES FOR ADVANCED UNDERGRADUATES

**201. Introduction to Spanish Literature.** Reading of modern authors of Spain and Spanish America. I, II; 3. Prerequisite: Spanish 104, or four years of high school Spanish; junior standing, or consent of instructor. Cannizzo, Hutter, Osgood.

**202. Introduction to Spanish Literature.** Reading of modern authors of Spain and Spanish America. I, II; 3. Prerequisite: Spanish 201; junior standing, or consent of instructor. CANNIZZO, HUTTER, OSGOOD.

**211. Intermediate Composition and Conversation.** Required for teacher-training majors in Spanish. I, II; 3. Prerequisite: Spanish 104, or four years of high school Spanish. FLORES and others.

**212. Intermediate Composition and Conversation.** Required for teacher-training majors in Spanish. I, II; 3. Prerequisite: Spanish 211, or equivalent. FLORES and others.

**213. Advanced Composition and Conversation.** I; 3. Prerequisite: Spanish 212, or equivalent. FLORES and others.

**214. Advanced Composition and Conversation.** II; 3. Prerequisite: Spanish 213, or equivalent. FLORES and others.

**215. Spoken Spanish.** Intensive course. Exclusively oral-aural. Required for all teacher-training majors in Spanish. I, II; 4. Prerequisite: Senior standing; Spanish 212. DE MUNDO, FLORES.

**231. Commercial Spanish.** I; 2. Prerequisite: Spanish 104, or four years of high school Spanish. FOSNAUGH, SAPORTA.

**232. Commercial Spanish.** II; 2. Prerequisite: Spanish 231. FOSNAUGH, SAPORTA.

**280. Teachers' Course.** I; 2. Required for teacher-training majors in Spanish. Prerequisite: Spanish 201 and 202, or 211 and 212. OSGOOD.

**291. Senior Thesis.** For candidates for honors in Spanish. I; 2. STAFF.

**292. Senior Thesis.** For candidates for honors in Spanish. II; 2. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Survey of Spanish Literature.** I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. FLORES.

**302. Survey of Spanish Literature.** II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. FLORES.

**303. Survey of Latin-American Literature.** I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. VAN HORNE.

**304. Survey of Latin-American Literature.** II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. VAN HORNE.

**311. Cervantes: Don Quixote.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1953-1954 and in alternate years. ALLEN.

**312. Cervantes: Don Quixote.** II; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1953-1954 and in alternate years. ALLEN.

**313. Classical Spanish Drama.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. OLIVER.

**314. Classical Spanish Drama.** II; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. OLIVER.

**321. Modern Spanish and Spanish-American Drama.** I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. PIETRANGELI.

**322. Modern Spanish and Spanish-American Drama.** II; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. PIETRANGELI.

**323. Modern Spanish and Spanish-American Novel.** Nineteenth and twentieth century novels of Spain. I; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. HAMILTON.

**324. Modern Spanish and Spanish-American Novel.** Nineteenth and twentieth century novels of Spanish America. II; 3 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. HAMILTON.

**325. Lyric Poetry.** Spanish and Spanish-American lyrics. I; 2 hours, or ½ unit. Prerequisite: Spanish 202, or equivalent. Offered in 1952-1953 and in alternate years. ALLEN.

**326. Lyric Poetry.** Spanish and Spanish-American lyrics. II; 2 hours, or ½ unit. Prerequisite: Spanish 325. Offered in 1952-1953 and in alternate years. ALLEN.

**331. La Cultura Hispánica: España.** In Spanish. Required for teacher-training majors in Spanish. I; 2 hours, or ½ unit. VAN HORNE.

**332. La Cultura Hispánica: America Hispaña.** In Spanish. II; 2 hours, or ½ unit.

**351. Phonetics.** I, II; 2 hours, or ½ unit. Required for teacher-training majors in Spanish. Prerequisite: Spanish 202, or equivalent. FLORES, KAHANE.

**352. Syntax.** I, II; 2 hours, or ½ unit. Required for teacher-training majors in Spanish. Prerequisite: Spanish 202, or equivalent. KAHANE.

## Italian

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours of Italian, excluding Italian 101 and 102, and including at least five hours from the group for advanced undergraduates and graduates. History 317 and 318, Humanities 301, and Italian 291 and 292 are acceptable. Italian 291 and 292 for majors can be arranged for advanced group credit.

**Minors:** Twenty hours in not more than two of the following subjects, with at least eight hours in each subject, if two are chosen: education, English (excluding Rhetoric 101 and 102), French, German, Greek, history, Latin, library science, medieval civilization studies, philosophy, Portuguese, Spanish.

### COURSES FOR UNDERGRADUATES

**101. Elementary Italian.** For students who have no credit in Italian. I; 4. Students with 95 or more credit hours receive only 3 hours credit. No credit toward graduation is given for Italian 101 without Italian 102. CANNIZZO, TRIOLO.

**102. Elementary Italian.** Continuation of Italian 101. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Italian 101, or one year of high school Italian. CANNIZZO, TRIOLO.

**103. Intermediate Italian.** Rapid reading, review of grammar, composition, conversation. I; 4. Prerequisite: Italian 102, or two years of high school Italian. PIETRANGELI.

**104. Intermediate Italian.** Continuation of Italian 103. II; 4. Prerequisite: Italian 103, or three years of high school Italian. PIETRANGELI.

### COURSES FOR ADVANCED UNDERGRADUATES

**291. Senior Thesis.** For candidates for honors in Italian. I; 2. STAFF.

**292. Senior Thesis.** For candidates for honors in Italian. II; 2. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Dante: La Divina Commedia.** I; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. PIETRANGELI.

**312. Dante: La Divina Commedia.** Continuation of Italian 311. II; 2 hours, or ½ unit.

Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. PIETRANGELI.

321. **Modern Italian Literature.** I; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. VAN HORNE.

322. **Modern Italian Literature.** II; 2 hours, or ½ unit. Prerequisite: Italian 101 and 102. Italian 103 and 104 are optional, but desirable. VAN HORNE.

### Portuguese

#### COURSES FOR UNDERGRADUATES

101. **Elementary Portuguese.** For students who have no credit in Portuguese. No credit toward graduation is given for Portuguese 101 without Portuguese 102. I; 4. Students with 95 or more credit hours receive only 3 hours credit. ALLEN, SANTOS.

102. **Elementary Portuguese.** Continuation of Portuguese 101. II; 4. Students with 95 or more credit hours receive only 3 hours credit. Prerequisite: Portuguese 101. ALLEN, SANTOS.

103. **Intermediate Portuguese.** Rapid reading, review of grammar, composition, and conversation. I; 4. Prerequisite: Portuguese 102, or two years of high school Portuguese. ALLEN, SANTOS.

104. **Intermediate Portuguese.** Continuation of Portuguese 103. II; 4. Prerequisite: Portuguese 103, or three years of high school Portuguese. ALLEN, SANTOS.

#### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

301. **Introduction to Brazilian Literature.** Survey of the contemporary Brazilian novel. I; 3 hours, or ½ unit. Prerequisite: Portuguese 101 and 102. Portuguese 103 and 104 are optional, but desirable. ALLEN.

302. **Introduction to Portuguese Literature.** Survey of the Golden Age of Portuguese. II; 3 hours, or ½ unit. Prerequisite: Portuguese 101 and 102. Portuguese 103 and 104 are optional, but desirable. ALLEN.

## SPEECH

*Professors:* K. R. WALLACE (Head of Department), G. FAIRBANKS, B. HEWITT, SEVERINA E. NELSON, W. M. PARRISH.
*Associate Professors:* E. T. CURRY, O. A. DIETER, MARIE K. HOCHMUTH, L. S. HULTZÉN, J. C. KELLY, H. O. KUBLY, R. MURPHY, C. H. SHATTUCK, W. SWANSON, K. A. WINDESHEIM.
*Assistant Professors:* H. E. GULLEY, H. L. MUELLER, C. B. OWENS, J. W. SCOTT.
*Instructors:* MARY H. ARBENZ, CLARA BEHRINGER, K. BURNS, A. S. HOUSE, NAOMI W. HUNTER, IDA LEVINSON, PATRICIA MCILRATH, G. W. MCKINNEY, R. E. NADEAU, L. W. OLSON, MARIE O. SHERE.
*Assistants:* K. D. BAXTER, M. R. BOGARD, W. E. BROCKRIEDE, A. G. BROOKS, K. G. CRIDER, N. DONAHOE, W. H. DRAPER, RUBY L. DRAUGHON, T. E. FINFGELD, WILMA H. GRIMES, PATTI M. GRUBB, N. GUTTMAN, VIRGINIA HEIDINGER, F. M. HULL, C. L. HUTTON, E. P. JORDAN, CHARLOTTE KECK, F. KODMAN, J. MELROSE, G. E. REDDICK, JOY A. REDFIELD, GENEVIEVE RICHARDSON, M. L. RIGLER, W. G. ROBERTZ, H. A. RUNDELL, R. L. SCOTT, A. WOLLOCK.

#### REQUIREMENTS FOR L.A.S. STUDENTS

Major: Twenty hours in speech in addition to Speech 101, 105, 141. At least five of the twenty hours must be in courses numbered 300 or higher; Speech 301 must be in-

cluded. In declaring a major in speech, the student may choose one of these areas for emphasis: general speech, public address, interpretation, theatre, speech science, hearing disorders, speech correction. The student should report to 134 Lincoln Hall to be assigned an area adviser with whom he will confer concerning required and recommended courses.

**Minors:** Twenty hours chosen in consultation with the adviser in one or two of the following subjects: classics, economics, English, French, German, history, Italian, law, library science, philosophy, physics, physiology, political science, psychology, sociology and anthropology, Spanish, zoology. Certain courses in architecture, art, music, or not more than eight hours from the following courses in physical education may be selected: Dance 162, 163, 164, 240, 241, 243, 244, 245, 246, and Recreation 176, 270, 271, 272, 275, 278. A minor may consist of the program of studies in medieval civilization. If two subjects are selected for the minor at least eight hours must be taken in each. No language courses may satisfy the minor requirements if they are excluded from the majors of the language departments.

Two teacher-training curricula are offered in speech: one in speech correction (see Miss Nelson) and one in the teaching of speech (see Mr. Windesheim).

### COURSES FOR UNDERGRADUATES

**101. Principles of Effective Speaking.** Preparation and presentation of short informative and persuasive speeches, with emphasis on the selection and organization of material, methods of securing interest and attention, and the elements of delivery. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Prerequisite: A passing grade in Rhetoric 101 placement examination, or a passing grade in Rhetoric 100. Brockriede, Burns, Crider, Dieter, Draper, Draughon, Finfgeld, Nadeau, Olson, Owens, Parrish, Reddick, Robertz, Scott, Wallace.

**105. Voice and Articulation.** A drill course for improving the use of the normal speaking voice. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Arbenz, Kelly, Mueller.

**107. Parliamentry Procedure.** Principles and practice of parliamentary procedure. I, II; 2. Students with 95 or more credit hours receive only 1 hour credit. Murphy.

**111. Business and Professional Speaking.** Study, preparation, and presentation of the chief types of business speeches, with special attention to conferences, sales talks, interviews, job applications. I, II; 2. Prerequisite: Speech 101; sophomore standing. Olson, Windesheim.

**117. Argumentation.** Methods of logical analysis; the kinds and forms of argument; the adaptation of argumentative materials to audience situations; and the forms of debate. Practice debates on current subjects. I, II; 3. Prerequisite: Speech 101; sophomore standing. Dieter, Gulley, Murphy.

**141. Oral Interpretation.** Principles of interpretation, analysis, and oral reading of prose literature and verse. I, II; 3. Students with 95 or more credit hours receive only 2 hours credit. Bogard, Brooks, Burns, Grimes, McIlrath, Mueller, Parrish, Wollock.

**157. Elements of Stagecraft.** The design of stage scenery; the materials and methods of scenery construction and stage lighting. Lectures, readings, and practical problems. I, II; 4. McKinney.

**161. Fundamentals of Acting.** A study of the methods of acting, with emphasis given to basic stage techniques. The role of the character in relation to the play as a whole; the intellectual and emotional values of the play and their interpretation by means of voice and action. I, II; 3. Prerequisite: Speech 141. Arbenz, Behringer, Donahoe, Richardson.

**164. Radio Speaking.** Preparation and presentation of the chief types of radio speeches, and of the interview, round table, and discussion. Microphone experience. I, II; 2. Prerequisite: Consent of instructor.

### COURSES FOR ADVANCED UNDERGRADUATES

**203. Dramatics for Teachers.** A survey of methods and procedures of play production in the secondary school. I; 3. RICHARDSON.

**204. Speech for Teachers.** A course designed for prospective teachers who are non-speech majors. A discussion of methods and materials available for teaching speech and directing extracurricular speech activities. II; 3. Prerequisite: Senior standing; consent of instructor. BURNS, MUELLER.

**208. Classroom Problems in Speech Correction.** Orientation of prospective teachers to speech needs of pupils in elementary and secondary schools. I, II; 3. Prerequisite: Junior standing. SHERE.

**213. Methods and Materials of Public Discussion.** Getting information and reaching decisions through procedures of democratic discussion. Practice in designing, participating in, and moderating patterns of discussion used in conference and forum with materials drawn from current public questions. I, II; 3. Prerequisite: Speech 101; junior standing. GULLEY, MURPHY.

**218. Advanced Argumentation.** An inclusive study of methods of controversy revealed in public questions and famous debates. Practice in arguing, examining, adjudicating. I; 3. Prerequisite: Speech 117; junior standing. MURPHY.

**221. Persuasion.** Study of the nature and methods of attention, suggestion, and motivation as applied to speechmaking for the influencing of group opinion and action. Preparation and presentation of short persuasive speeches. I, II; 3. Prerequisite: Speech 101; junior standing. HOCHMUTH, NADEAU, OWENS, WALLACE.

**243. Oral Interpretation of Shakespeare.** Analysis and oral presentation of selections from Shakespeare's plays. I; 2. Prerequisite: Speech 141; junior standing. ARBENZ.

**247. Teaching of Speech.** Same as Education 247. A study of methods and materials used in teaching speech in the high school. I, II; 5. Prerequisite: Senior standing; 3.5 grade average. BURNS.

**255. Play Directing.** An analysis of the director's duties; the basic elements of play structure as they relate to play directing; stage composition and movement; rhythm. I; 3. Prerequisite: Speech 161; junior standing. DONAHOE.

**256. Play Directing.** Principles and methods of choosing plays for production; organization of the production staff; casting; coaching actors; the techniques of planning and conducting rehearsals and performances. II; 3. Prerequisite: Speech 255. DONAHOE.

**261. Advanced Acting.** The psychology of acting; methods of preparing a role; acting techniques for period plays. I, II; 3. Prerequisite: Speech 161; consent of instructor. ARBENZ, MCILRATH, SWANSON.

**263. Introduction to Playwriting.** Theory and practice of writing for the theater, with emphasis on basic techniques. Writing of scenes and one-act plays. I, II; 3. Prerequisite: Consent of instructor. KUBLY.

**264. Radio Acting.** Same as Journalism 264. The technique and special problems of acting in radio. Lectures, demonstrations, and practical microphone experience, with the emphasis throughout on individual development in interpretation and characterization. I, II; 2. Prerequisite: Consent of instructor. RIDER.

**291. Thesis and Honors.** I; credit to be arranged. Open to seniors with a 4.0 average.

**292. Thesis and Honors.** II; credit to be arranged. Open to seniors with a 4.0 average.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**301. Introduction to Phonetics.** Basic principles of phonetic study, including observation and representation of pronunciation; ear training; practice in transcription. I, II; 3 hours, or ½ to 1 unit. HULTZÉN, MUELLER, PARRISH.

**311. British Public Address.** Study of representative British speakers from the sixteenth century to the present. Lectures, reports, and papers. I; 3 hours, or ½ to 1 unit. Prerequisite: Speech 117 or 221. OWENS.

**312. American Public Address.** Study of representative American speeches from the sixteenth century to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 117 or 221. HOCHMUTH.

**321. Modern Rhetorical Theory, 1700 to 1890.** A consideration of the significant movements in the development of rhetorical theory in England, France, and America, from 1700 to 1890. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOCHMUTH.

**322. Modern Rhetorical Theory, 1890 to the Present.** A consideration of the significant movements in the development of rhetorical theory in England, France, and America, from 1890 to the present. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HOCHMUTH.

**342. Advanced Interpretation.** Oral interpretation of poetry. II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 141. MCILRATH, PARRISH.

**352. Theories of Play Production.** Origins and development of modern theatrical production; a critical examination of contemporary ideas and practices in theatre architecture, acting, directing, and staging. I; 3 hours, or ½ to 1 unit. SWANSON.

**361. History of the European Theatre to the Renaissance.** The theatre and the theatre arts of ancient and of medieval Europe. I; 3 hours, or ½ to 1 unit. SCOTT.

**362. History of the European Theatre from the Renaissance to 1900.** The European theatre and the theatre arts from 1576 to 1900, with special reference to the English theatre. II; 3 hours, or ½ to 1 unit. SCOTT.

**363. Advanced Play Writing.** Application of principles of dramatic form and structure to the more complex problems of playwriting. Practice in writing the full-length play. I, II; 3 hours, or ½ to 1 unit. (Course may be repeated for 3 hours.) Prerequisite: Speech 263; consent of instructor. KUBLY.

**366. Development of the American Theatre.** The development of the theatre and of theatre arts in America from colonial times to the beginning of the twentieth century. II; 3 hours, or ½ to 1 unit. HEWITT.

**370. Stage Scenery Design.** Theory and practice of designing stage scenery. II; 3 hours, or ½ to 1 unit. Prerequisite: Speech 157 and two of the following: Speech 255, 352, 361, 362; or consent of instructor. SCOTT.

**371. History and Principles of Literary and Rhetorical Criticism: Aristotle to Sidney.** Same as English 371. I; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

**372. History and Principles of Literary and Rhetorical Criticism: Sidney to the Present.** Same as English 372. II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing. HERRICK.

**373. Phonetics and Phonemics.** Methodologies of phonetics, with special application to English; general principles of phonemic interpretation. I or II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; Speech 301. HULTZÉN.

**375. Speech Science.** Introduction to anatomical and physiological characteristics of the normal speech mechanism. Demonstration in speech laboratory. I, II; 3 hours, or 1 unit. Prerequisite: Ten hours of speech; senior standing, or consent of instructor. CURRY.

**376. Speech Science.** Introduction to the acoustical characteristics of voice and speech sounds and to the physiology of the ear. Demonstration in speech laboratory. II; 3 hours, or ½ unit. Prerequisite: Speech 375. CURRY.

**383. Psychological Disorders of Speech.** Principles and methods of clinical and classroom

correction of psychological disorders of speech, with special reference to stuttering and delayed speech; clinical and classroom practice with children and adults. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Senior standing; consent of instructor. WISCHNER.

**385. Speech Correction.** Study of the causes, symptoms, and treatment of speech disorders, including articulatory, vocal, and rhythmical disorders; observation and practice in clinical techniques are provided in laboratory. I; 4 hours, or ½ to 1 unit. Prerequisite: Ten hours of speech, or consent of instructor; senior standing. NELSON.

**386. Clinical Practice.** Case work and practice teaching in remedial speech. Must be taken concurrently with Speech 385. I; 1 to 3 hours, or ½ unit. NELSON and others.

**387. Voice and Articulation Disorders.** Principles and methods of clinical and classroom correction of voice and articulation disorders. I or II; 3 hours, or ½ unit. Prerequisite: Speech 385; consent of instructor. KELLY.

**388. Speech Correction.** Study of causes, symptoms, and treatment of speech disorders, including stuttering, cerebral palsy, aphasia, and glandular disorders. II; 4 hours, or ½ unit. Prerequisite: Speech 385. NELSON.

**389. Clinical Practice.** Case work and practice teaching in remedial speech. Must be taken concurrently with Speech 388. II; 1 to 3 hours, or ½ unit. NELSON and others.

**391. Introduction to Hearing Disorders.** Analysis of symptoms and causes of hearing losses; effects of hearing loss upon oral communication, education and psychological adjustment; principles of retraining the hard of hearing. I, II; 3 hours, or ½ unit. Prerequisite: Ten hours of speech; Speech 301; junior standing, or consent of instructor. HOUSE.

**393. Aural Rehabilitation.** Principles and methods of clinical and classroom retraining of the hard of hearing, including lip reading, auditory training, speech correction and conservation, counseling. Clinical and classroom practice with children and adults. I, II; 3 hours, or ½ unit. Prerequisite: Speech 391; senior standing, or consent of instructor. Required in the curriculum of teacher training in speech correction. KELLY.

**395. Audiometry and the Use of Hearing Aids.** Selective and diagnostic tests of hearing, the planning and conduct of hearing conservation programs, general problems involved in the use of hearing aids. I, II; 3 hours, or 1 unit. Prerequisite: Speech 376. HOUSE.

## THEORETICAL AND APPLIED MECHANICS

*Professors:* F. B. SEELY (Head of Department), W. L. COLLINS, T. J. DOLAN, J. O. DRAFFIN, M. L. ENGER (Emeritus), N. E. ENSIGN (Emeritus), H. L. LANGHAAR, W. M. LANSFORD, H. F. MOORE (Emeritus), N. O. MYKLESTAD, W. J. PUTNAM, H. J. SCHRADER, W. L. SCHWALBE, J. O. SMITH.
*Associate Professors:* W. E. BLACK, R. E. CRAMER, W. N. FINDLEY, P. G. JONES.
*Assistant Professors:* C. E. BOWMAN, R. L. BROWN, M. E. CLARK, H. T. CORTEN, W. J. CRAIG, C. W. DOLLINS, H. M. FITCH, E. HOGNESTAD, R. S. JENSEN, A. Q. MOWBRAY, W. M. OWEN, O. M. SIDEBOTTOM, G. M. SINCLAIR, M. C. STEELE, C. E. TAYLOR, I. M. VIEST, H. R. WETENKAMP, W. J. WORLEY.
*Associates:* A. P. BORESI, R. C. ELSTNER, A. H. HAUSRATH, C. K. LIU, M. E. LUNCHICK, K. S. PISTER, L. B. TAPLIN, C. E. WORK.
*Research Consultant:* A. M. FREUDENTHAL.
*Instructors:* T. M. ELSESSER, W. B. SANDERS, J. R. SNOWDEN, F. J. STANEK.
*Assistants:* F. G. BAULING, D. R. CARVER, W. D. JORDAN, R. W. KARRY, T. P. KERR, J. L. KRAHULA, A. LAUPA, J. J. POCZATEK, F. C. RALLY, D. D. STROHBECK.

### COURSES FOR UNDERGRADUATES

**150. Analytical Mechanics (Statics).** Resultants of force systems, algebraic and graphical conditions of equilibrium of force sysetms. Analysis of forces acting on members of trusses, frames, etc. Forces due to friction. Centroids. I, II; 2. Prerequisite: Registration in Mathematics 142. STAFF.

**154. Analytical Mechanics (Statics and Dynamics).** A combination of Theoretical and Applied Mechanics 150 and 211 with less emphasis on some topics. For electrical engineering students only. I, II; 4. Prerequisite: Registration in Mathematics 142. STAFF.

**156. Analytical Mechanics (Statics and Dynamics).** A combination of Theoretical and Applied Mechanics 150 and 211. I, II; 5. Prerequisite: Registration in Mathematics 142. STAFF.

**171. Elements of Mechanics.** Resultants and equilibrium of force systems; conditions of equilibrium applied to trusses, frames, etc.; forces due to friction; centroids; stress and deformation in direct tension and compression; riveted and welded joints; properties of materials. For architects only. I, II; 3. Prerequisite: Mathematics 122. DRAFFIN and others.

**172. Strength of Materials.** Relationships between external forces acting on beams and the stresses produced; shear, moment, slope, and deflection diagrams; moment of inertia; columns. For architectes only. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 171. DRAFFIN and others.

### COURSES FOR ADVANCED UNDERGRADUATES

**211. Analytical Mechanics (Dynamics).** Displacement, velocity, and acceleration of a particle; relation between forces acting on rigid bodies and the changes in motion produced; translation; rotation; plane motion; solutions using the principles of force, mass and acceleration, work and energy, and impulse and momentum. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150. STAFF.

**221. Resistance of Materials.** Relationships between external forces acting on elastic bodies and the stresses and deformations produced; tension and compression members; members subjected to torsion and to bending; columns; combined stresses; properties of materials. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 150, 154, or 156. STAFF.

**223. Resistance of Materials Laboratory.** Tests of steel, cast iron, aluminum alloys, concrete, and wood; determination of such mechanical properties as strength, hardness, ductility, energy resistance; engineering significance of mechanical properties. I, II; 1. Prerequisite: Registration in Theoretical and Applied Mechanics 221. STAFF.

**232. Fluid Mechanics.** Analysis of flow of fluids in pipes and in open channels. Bernoulli's theorem; viscosity, laminar and turbulent flow; effects of jets on vanes; hydraulic similitude; dimensional analysis; Reynolds' and Froude's numbers. I, II; 3. Prerequisite: Theoretical and Applied Mechanics 211. LANSFORD and others.

**234. Laboratory in Fluid Mechanics.** Measurement of pressure and quantity of flow; venturi and nozzle meters; cavitation; viscosimetry; laminar and turbulent flow of water and oil in smooth and rough pipes; flow in open channels; weirs and orifices; pumps and turbines. I, II; 1. Prerequisite: Registration in Theoretical and Applied Mechanics 232. LANSFORD and others.

**297. Thesis.** I; 3. Prerequisite: Senior standing; approval of head of department. STAFF.

**298. Thesis.** Continuation of Theoretical and Applied Mechanics 297. II; 3. Prerequisite: Senior standing; approval of head of department. STAFF.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**311. Mechanical Vibrations.** Kinematics of vibratory motion. Comprehensive study of motion having single degree of freedom. Critical speeds of shafts; vibration of systems with several degrees of freedom. Applications to engineering problems. I; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 154 or 156 or 211 and 221. JONES, MYKLESTAD.

**321. Advanced Mechanics of Materials.** Methods used in elementary mechanics of materials are expanded and generalized and used to solve more complex problems. Thick-walled cylinders, torsion of bar having non-circular cross-section; curved beams, unsymmetrical bending, flat plates; theories of failure. I; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 221 and 223. BLACK, SMITH.

**323. Advanced Laboratory in Materials Testing.** Calibration of testing machines and of strain measuring instruments. Use of various mechanical and electrical strain gauges. Interpretation of tests results. Relation of tests to specifications of materials. I, II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 221 and 223. COLLINS, PUTNAM.

**326. Experimental Stress Analysis.** Measurement of stresses or deformations that are of significance in the engineering design of load resisting members. Use of optical, electrical, and mechanical instrumentation, models, analogies, brittle coatings, electrical resistance gauges, photoelasticity, etc. II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 150, 211, 221, and 223 (321 desirable). DOLAN.

**334. Fluid Mechanics and Advanced Hydraulics.** A study of the basic properties of fluids in general, particularly those that influence the flow of fluids in pipes and open channels, viscosimetry, dimensional analysis, effect of boundary conditions, cavitation, water tunnel, hydraulic jump, water hammer, pumps, turbines. Some laboratory work. II; 3 hours, or ½ to 1 unit. Prerequisite: Theoretical and Applied Mechanics 232 and 234. LANSFORD.

## VETERINARY MEDICINE

**(Including Veterinary Anatomy and Histology, Veterinary Clinical Medicine, Veterinary Pathology and Hygiene, and Veterinary Physiology and Pharmacology)**

Three types of courses are offered by the College of Veterinary Medicine: (1) courses for undergraduates, designed as service courses for students in the College of Agriculture; (2) professional courses, which are part of the curriculum in veterinary medicine; and (3) courses for graduates.

## VETERINARY ANATOMY AND HISTOLOGY

*Professor:* L. E. ST. CLAIR (Head of Department).
*Assistant Professor:* M. S. COVER.
*Instructors:* G. A. LINTON, ELIZABETH J. REEVES.

### COURSES FOR UNDERGRADUATES

**101. Anatomy of Domestic Animals.** A study of the structure of cells, tissues, organs, and systems of domestic animals. For students in agriculture. Lectures and demonstrations. I; 3. Prerequisite: Sophomore standing. ST. CLAIR and assistant.

### PROFESSIONAL COURSES

**311. Gross Anatomy.** Systematic and topographic study and dissection of the dog. Lec-

tures, discussions, demonstrations, quizzes, and laboratory. I; 5. Prerequisite: Registration in the veterinary curriculum, or consent of instructor. St. Clair and assistant.

312. **Gross Anatomy.** Comparative study and dissection of domestic animals with special reference to development and adaptation to function. Lectures, discussions, demonstrations, quizzes, and laboratory. II; 5. Prerequisite: Veterinary Anatomy 311, or consent of instructor. St. Clair and assistant.

313. **Histology and Embryology.** Structure and development of cells and tissues with special reference to domestic animals. Lectures, discussions, demonstrations, quizzes, and laboratory. I; 5. Prerequisite: Registration in the veterinary curriculum, or consent of instructor. Cover and assistant.

314. **Histology and Embryology.** Structure and development of organs and systems with comparison in different domestic animals. Lectures, discussions, demonstrations, quizzes, and laboratory. II; 5. Prerequisite: Veterinary Anatomy 313, or consent of instructor. Cover and assistant.

## VETERINARY CLINICAL MEDICINE

*Professor:* L. E. Boley (Head of Department).
*Associate Professor:* R. D. Hatch.
*Assistant Professors:* H. J. Hardenbrook, R. E. Witter.
*Instructors:* R. D. Butzow, P. J. Meginnis.
*Assistant:* D. Maksic.

### PROFESSIONAL COURSES

331. **Diseases of Small Animals.** Diagnosis, treatment, and prophylaxis of infectious, noninfectious, and surgical diseases of small domestic animals. I; 5. Prerequisite: Third-year standing in veterinary curriculum. Witter.

333. **Breeding Problems and Obstetrics.** General principles of obstetrics and discussion of the breeding diseases of farm animals. Lectures, discussions, and laboratory. II; 5. Prerequisite: Third-year standing in veterinary curriculum. Boley.

334. **Diseases of Large Animals.** Diagnosis, treatment, and prevention of non-infectious, nutritional, metabolic, toxic, and parasitic diseases of large animals. Lectures and discussions. II; 5. Prerequisite: Third-year standing in veterinary curriculum. Hatch.

335. **General Surgery.** General surgical principles and procedures, including restraint, anesthesia, equipment, and all phases of tissue injury and repair. I; 3. Prerequisite: Third-year standing in veterinary curriculum. Hardenbrook, Meginnis.

336. **Special Surgery.** Lectures and clinical demonstrations on surgical diseases, their diagnosis, operative procedure, and after care. II; 5. Prerequisite: Third-year standing in veterinary curriculum. Hardenbrook, Meginnis.

337. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. I; 2. Prerequisite: Third-year standing in veterinary curriculum. Boley and staff.

338. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. II; 2. Prerequisite: Third-year standing in veterinary curriculum. Boley and staff.

340. **Jurisprudence, Business Methods, and Ethics.** Same as Management 340. Principles of law, business procedures, and professional ethics of importance to members of the veterinary profession; animal diseases and related regulatory laws and their administration; federal procedure under animal disease and food and meat inspec-

tion laws. II; 3. Prerequisite: Senior standing in veterinary curriculum. HANNAH, CARRITHERS, WOODS.

341. **Infectious Diseases of Large Animals.** Diagnosis, treatment, and prophylaxis of the infectious diseases of large animals. Lectures, discussions, and quizzes. I; 5. Prerequisite: Fourth-year standing in veterinary curriculum. HATCH.

343. **Radiology.** General principles of radiology including technique and its application to the diagnosis and therapy of animal diseases. Lectures and discussion. I; 1. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. MEGINNIS.

345. **Seminar.** Assigned reading and discussion of cases presented for diagnosis and treatment. I; 1. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

346. **Seminar.** Assigned reading and discussion of cases presented for diagnosis and treatment. II; 1. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

347. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. I; 8. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

348. **Clinical and Laboratory Practice.** Clinical and laboratory practice in diagnosis, treatment, and prophylaxis of animal diseases. II; 8. Prerequisite: Fourth-year standing in veterinary curriculum. BOLEY and staff.

## VETERINARY PATHOLOGY AND HYGIENE

*Professors:* R. GRAHAM (Head of Department), C. C. MORRILL, J. O. ALBERTS.
*Associate Professors:* P. D. BEAMER, N. D. LEVINE, ETHEL MCNEIL.
*Assistant Professors:* H. S. BRYAN, O. D. GRACE, M. E. MANSFIELD, H. E. RHOADES, G. T. WOODS.
*Instructors:* P. R. ALLEN, L. R. BAIN, P. B. BARTO, EMILY L. DORSTEWITZ, L. E. HANSON, S. C. SCHMITTLE, A. M. WATRACH, F. H. WHITE.
*Assistants:* G. BISWAL, VIRGINIA IVENS.

### COURSES FOR UNDERGRADUATES

105. **Animal Hygiene.** Contagious, infectious, parasitic, nutritional, and metabolic diseases of animals; their relation to agriculture and public health, and their prevention. Lectures. Recommended for students in animal, dairy, and poultry husbandry. I; 3. Prerequisite: Sophomore standing. BARTO, GRAHAM.

### PROFESSIONAL COURSES

323. **Bacteriology and Immunology.** The bacteriology and immunology of diseases of domestic and wild animals caused by bacteria, fungi, rickettsiae, and filtrable viruses. Lectures, quizzes, and laboratory. I; 5. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. BRYAN and assistant.

324. **Parasitology.** Protozoa, helminths, arthropods, and other parasites affecting domestic animals. Lectures, discussions, and laboratory. I; 5. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. LEVINE and assistant.

325. **General Pathology.** The basic principles of pathological processes including tissue injury and repair, circulatory and metabolic disturbances, inflammation and neoplasia. Lectures, quizzes, demonstrations, and laboratory. II; 5. Prerequisite: Second-

year standing in veterinary curriculum, or consent of instructor. MORRILL and assistant.

**326. Special Pathology.** Disease processes affecting organs and anatomic systems and those occurring in specific diseases. Lectures, quizzes, demonstrations, and laboratory. I; 5. Prerequisite: Third-year standing in veterinary curriculum, or consent of instructor. MORRILL and assistant.

**332. Principles of Sanitation in the Processing and Handling of Foods.** Same as Food Technology 332. A study of the principles of sanitation with appropriate emphasis on practical considerations as they apply to various food processing industries. Control of insects, rodents, and microorganisms; fundamentals of detergency; sanitation of water supplies; waste disposal methods. Government and public health regulations. Local field trips to food processing plants. II; 2. Prerequisite: Bacteriology 104, 105, and Chemistry 132, or equivalents. ORDAL.

**344. Food Hygiene and Public Health.** General principles of antemortem inspection of food animals; the procedures and techniques used in the inspection of food of animal origin for type, class, and grade; diseases of animals transmissible to man. II; 5. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. MEGINNIS, TEIGLER.

**349. Diseases of Poultry.** The causes, symptoms, lesions, prevention, and treatment of non-infectious and infectious diseases of domestic birds. Lectures, quizzes, and demonstrations. I; 3. Prerequisite: Fourth-year standing in veterinary curriculum, or consent of instructor. ALBERTS.

## VETERINARY PHYSIOLOGY AND PHARMACOLOGY

*Professor:* J. SAMPSON (Head of Department).
*Associate Professors:* R. P. LINK, C. K. WHITEHAIR.
*Instructor:* T. R. HOUPT.

### COURSES FOR UNDERGRADUATES

**102. Physiology of Domestic Animals.** Lectures and recitations or demonstration. II; 3. Prerequisite: Chemistry 101, or equivalent; sophomore standing. Veterinary Anatomy 101 is recommended. LINK, SAMPSON.

### PROFESSIONAL COURSES

**321. Physiology.** Blood and lymph, circulation, respiration, digestion and absorption, excretion. Lectures, quizzes, demonstrations, and laboratory. I; 4. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. SAMPSON and assistant.

**322. Physiology.** Metabolism, heat production, endocrine organs, muscle and nerve, central nervous system, special senses, reproduction. Lectures, quizzes, demonstrations, and laboratory. II; 4. Prerequisite: Second-year standing in the veterinary curriculum, or consent of instructor. SAMPSON and assistant.

**329. Pharmacology.** General principles of pharmacy and an analysis of the action of chemical agents on physiological processes. Lectures and discussion. II; 3. Prerequisite: Second-year standing in veterinary curriculum, or consent of instructor. LINK.

**330. Pharmacology.** Principles of drug action and an analysis of the action of chemical agents on living organisms. Lectures and laboratory. I; 4. Prerequisite: Veterinary Physiology and Pharmacology 329, or consent of instructor. LINK.

# ZOOLOGY

*Professors:* F. B. Adamstone (Head of Department), L. A. Adams (Emeritus), C. G. Hartman (Emeritus), S. C. Kendeigh, R. R. Kudo, V. E. Shelford (Emeritus), L. J. Thomas, H. J. Van Cleave.
*Associate Professors:* H. I. Fisher, B. V. Hall, L. Ingle, O. E. Kugler, W. M. Luce, S. M. Rose, H. M. Smith.
*Assistant Professors:* C. C. Clark, D. F. Hoffmeister, J. B. Kitzmiller, M. R. Matteson, H. H. Shoemaker.
*Instructor:* F. J. Kruidenier.
*Assistants:* D. T. Clark, N. R. Cooley, G. Garoian, J. S. Greenstein, E. J. Hugghins, D. A. James, T. King, A. Kurland, J. C. List, R. E. Ogren, Mabel C. Paterson, K. A. Rafferty, Jr., I. B. Sachs, M. Sacks, D. Shomay, J. D. Tiner, R. G. Van Gelder, C. M. Weise.

### REQUIREMENTS FOR L.A.S. STUDENTS

**Major:** Twenty hours in zoology excluding Zoology 101, 104, 107, and Biological Sciences 100, and including five hours of advanced work. Entomology 313 may be applied for major credit.

**Minors:** Twenty hours chosen from one or two of the following subjects: animal science, bacteriology, botany, chemistry, education, entomology, geography, geology, mathematics, physics, physiology, psychology. At least eight hours must be taken in each subject, if two are chosen.

Note: Division of General Studies 131 and 132 may be substituted for Zoology 101 or 104 wherever the latter two constitute a prerequisite.

### COURSES FOR UNDERGRADUATES

**101. General Zoology.** Animal biology; structure, function, environmental relations, origin, and development of animals. This course is designed for zoology majors and to satisfy part of the requirements for premedical students. Lectures, laboratory, and quiz. I, II; 5. Students with 95 or more credit hours receive only 4 hours credit. Fisher, Kitzmiller, Luce.

**104. Elementary Zoology.** Fundamental principles of the structure, physiology, reproduction, ecology, and evolution of animals, with special emphasis on their relations to human life. This course and Botany 100 meet the general education biological requirement in the College of Liberal Arts and Sciences and the zoology requirement for students in agriculture. I, II; 4. Students with 95 or more credit hours receive only 3 hours credit. Ingle.

**107. Evolution.** Analysis of the theories of evolution, the mechanism of evolutionary changes, and the evolution of man. I; 3. Prerequisite: Sophomore standing. Kitzmiller.

**132. Comparative Vertebrate Anatomy.** Classification and distribution of the vertebrate animals. Comparative anatomy of organs and organ systems, their function and evolution. Lectures, laboratory, and quiz. I, II; 5. Prerequisite: Zoology 101, or one year of general biology such as biological sciences or botany-zoology sequence. A grade of "C" in Zoology 101 is required for freshmen. Shoemaker, Smith.

### COURSES FOR ADVANCED UNDERGRADUATES

**240. Introduction to Ecology.** Seasonal and climatic relations of species and communities. II; 3 to 4. Prerequisite: Zoology 101, or equivalent; junior standing. Shoemaker.

### COURSES FOR ADVANCED UNDERGRADUATES AND GRADUATES

**300. General Seminar.** For members of the staff and graduate students. Also open to

seniors whose major is zoology. I; no credit. Attention is called to the following special clubs and seminars, some of which are interdepartmental: Animal Ecology Club, Genetics Seminar, Endocrinology Seminar. STAFF.

**301. General Seminar.** For members of the staff and graduate students. Also open to seniors whose major is zoology. II; no credit. Attention is called to the following special clubs and seminars, some of which are interdepartmental: Animal Ecology Club, Genetics Seminar, Endocrinology Seminar. STAFF.

**302. Individual Topics.** For those who wish to study individual problems. Candidates for honors and undergraduates who are enrolled for tutorial work or in individual curricula should register in this course. Graduates may register for topics involving individual work not assigned in other courses. Laboratory, conferences, and readings. I; 2 to 5 hours, or ½ to 1 unit. Prerequisite: Two years of zoology; senior standing; approval of department. STAFF.

**303. Individual Topics.** For those who wish to study individual problems. Candidates for honors and undergraduates who are enrolled for tutorial work or in individual curricula should register in this course. Graduates may register for topics involving individual work not assigned in other courses. Laboratory, conferences, and readings. II; 2 to 5 hours, or ½ to 1 unit. Prerequisite: Two years of zoology; senior standing; approval of department. STAFF.

**304. Field and Systematic Zoology.** Collection, preservation, and identification of lower vertebrates and land and fresh water invertebrates; habits and life histories of selected forms. I; 5 hours, or 1 unit. Prerequisite: One year of zoology, or equivalent; senior standing. MATTESON.

**306. Biology for Teachers.** Same as Botany 306. A teacher-training and review course for those engaged in or preparing for teaching general biology in high school. II; 2 hours, or ¼ or ½ unit. Prerequisite: Botany 100; Zoology 101. FULLER, MATTESON.

**318. Protozoology.** Morphology, taxonomy, physiology, and life history of representative free-living and parasitic protozoa. I, II; 5 hours, or 1 unit. Prerequisite: One year of zoology, or equivalent; senior standing. KUDO.

**320. Invertebrate Zoology.** Invertebrates: structure and development. Application of biological principles. Specific and comparative morphology of the invertebrates; coordination of structure and function, origin, development, and life histories. II; 4 hours, or 1 unit. Prerequisite: Zoology 101. INGLE.

**321. Helminth-Parasitology.** Worm parasites, life cycles, morphology, taxonomy, environmental relations. Lecture, laboratory, technic, readings, quiz, demonstrations, problems. I, II; 5 hours, or 1 unit. Prerequisite: Zoology 132; senior standing. THOMAS.

**332. Advanced Vertebrate Zoology.** Vertebrate morphology; comparative anatomy, evolution, and function of vertebrate organ systems, with special emphasis on the evolution, anatomy, and function of the skeletal and nervous systems. Lectures and laboratory. II; 4 hours, or 1 unit. Prerequisite: Zoology 333. Offered in 1952-1953 and in alternate years. HALL.

**333. Vertebrate Embryology.** The development of the vertebrate body and its organs. I, II; 5 hours, or 1 unit. Prerequisite: Zoology 132. ADAMSTONE, KRUIDENIER.

**334. Vertebrate Histology.** Study and preparation of tissues of the vertebrate body. II; 3 hours, or ½ unit. Prerequisite: Zoology 333; junior standing, or consent of instructor. ADAMSTONE.

**335. Ornithology.** Structure, functions, environmental relations, habits, life history, and identification of birds. II; 3 hours, or ½ unit. Prerequisite: Zoology 101 or 104. FISHER, KENDEIGH.

**336. Mammalogy.** Classification, distribution, life history, evolution, and identification of mammals. Lecture, laboratory, and field work. I; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1953-1954 and in alternate years. HOFFMEISTER.

337. **Ichthyology.** Classification, structure, evolution, distribution, and life history of fishes. Lectures, laboratory, and field work. I; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1952-1953 and in alternate years. SHOEMAKER.

338. **Herpetology.** Classification, distribution, life history, and identification of reptiles and amphibia, particularly those of the United States. Lectures, laboratory, and field work. II; 3 hours, or ½ unit. Prerequisite: Zoology 132. Offered in 1953-1954 and in alternate years. SMITH.

341. **Field Ecology.** Study of biotic communities, birds and fish in the vicinity of Reelfoot Lake, Tennessee, covering six days. Students may enroll in subsequent years for additional credit by specializing in different fields of study. II; 1 hour, or ¼ unit. Prerequisite: Registration in Zoology 240, or 335, or equivalent. KENDEIGH, SHOEMAKER.

342. **Wildlife Management and Conservation.** Size and measurement of animal population, factors affecting reproduction and mortality, life history, management policies for fishes, mammals, and birds. I; 3 hours, or ½ unit. Prerequisite: Zoology 101 or 104. SHOEMAKER.

343. **Limnology.** Study of the lake, pond, and river with emphasis on the physical environment as well as on the plants and animals which live in fresh water. Lectures, discussions, laboratory, and field work. II; 3 hours, or ½ unit. Prerequisite: Zoology 101, or Botany 100. Offered in 1952-1953 and in alternate years. MATTESON.

345. **Animal Ecology.** Dynamics, development, and distribution of biotic communities. I; 3 to 5 hours, or ½ to 1 unit. Prerequisite: Senior standing; one year of zoology. KENDEIGH.

351. **Genetics.** Principles of heredity. Lectures, readings, and discussions. II; 3 hours, or ½ unit. Prerequisite: Zoology 101, 104, or one semester of any biological science. LUCE.

352. **Genetics.** Laboratory experiments illustrating the principles of heredity, problems, demonstrations. II; 2 hours, or ½ unit. Prerequisite: Credit or registration in Zoology 351. KITZMILLER, LUCE.

361. **Comparative Physiology.** Same as Physiology 361. A comparison of the general physiology of different groups of animals. I; 5 hours, or 1 unit. Prerequisite: Senior standing; three semesters of animal biology; two semesters of chemistry. PROSSER.

362. **Cellular Physiology.** Same as Physiology 362. A physico-chemical analysis of biological functions common to most living cells. II; 5 hours, or 1 unit. Prerequisite: Senior standing; two semesters each of biology and general physics; three semesters of chemistry. PROSSER.

363. **Endocrinology.** Same as Physiology 363. The glands of internal secretion with special references to the vertebrates. I annually, and II in 1953-1954 and alternate years; 5 hours, or 1 unit. Prerequisite: One semester of elementary zoology or physiology; Zoology 334, or organic chemistry. HALL.

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